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COLMAN'S RURAL WORLD.

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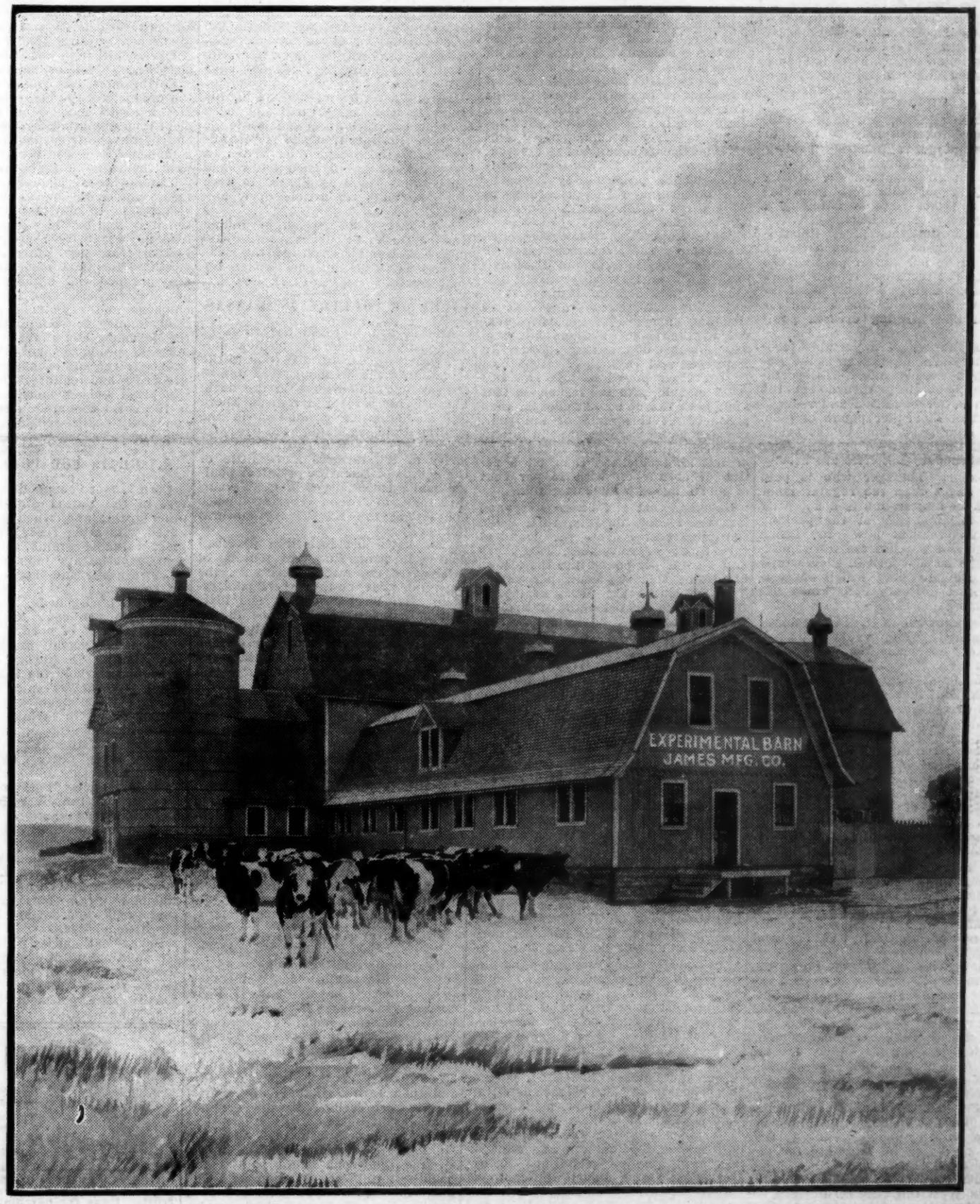
OLDEST AGRICULTURAL AND LIVE STOCK JOURNAL IN THE MISSISSIPPI VALLEY

Sixty-Seventh Year. ST. LOUIS, MO., FEBRUARY 5, 1914. Volume LXVII. No. 6.



IN THE POULTRY YARD

MECHANICAL DEVICES SAVE LABOR IN COMMERCIAL FATTENING OF POULTRY.

Experiments in Fattening Fowl for Market Show How Large Numbers Can Be More Economically Handled.

The Department of Agriculture has been carrying on experiments for over two years in the commercial fattening of fowl for the market, and has proven that mechanical labor-saving devices reduce the cost of fattening by reducing both the total amount of labor and the proportion of skilled labor required. The use of labor-saving mechanical devices has enabled one man to care for 4,000 to 5,000 birds. The results of the Department's experiments are published in a bulletin, "The Commercial Fattening of Poultry," which has just been issued and can be had by applying to the Department at Washington, D. C.

Provided stations are kept clean, mechanical features may be used to good advantage in handling poultry commercially, according to the Department's investigators. A mixing machine is particularly a good investment when one is fattening a large number of chickens.

The new bulletin gives illustrations of chickens in feeding batteries waiting to be fed and of pouring the feed into the troughs. It also shows other labor-saving devices, such as the spraying machine and a rack for squatted and hanging dressed poultry.

The advantage of a portable feeding battery are emphasized in the Department's experiments. The portable feeding battery turned out the birds in better condition and reduced the cost of labor per pound of gain. It also eliminated some of the bruising of the birds caused by rehandling where staticnary batteries are used.

An expert manager who is paid higher wages than the regular labor about a feeding station is a necessity unless the manager of the packing house understands how to fatten chickens and watches the work closely enough so that he can successfully direct ordinary help which successfully direct ordinary help which has had some experience.

The conclusions of the Department's experiments, which are just being published, are made for the seasons of 1911 and 1912. The experiments were made at four separate feeding stations and therefore four sets of figures are given.

The average cost and the amount of feed consumed in fattening 394,744 chickens in the four experiments during the season of 1911 were, respectively, as follows: Grain per pound of gain, 3.62, 3.33, 4.45, and 4.18 pounds; cost of feed per pound of gain, 7.83, 7.20, 7.15, and 8.71 cents; total cost per pound of gain, 9.18, 9.20, 8.96, and 10.27 cents.

The averages in 1912 for 498,681 chickens were: Grain per pound of gain, 4.42, 3.58, 3.72, and 4.98 pounds; cost of feed per pound of gain 8.74, 7.70, 6.61 and 9.95 cents; total cost per pound of gain, 10.37, 9.69, 7.98, and 11.54 cents.

Tallow, while making the fat on the birds more pronounced, increased the cost of gains. Thick condensed buttermilk in place of tallow produced better results.

Oat flour produced greater gains than low-grade wheat flour, but the latter feed produced cheaper gains.

Beef scraps added to the buttermilk in a fattening ration did not increase the gain. The addition of condimental feeds did not increase the appetite of the birds or help the gains. Grit is of no value in fattening for any period under 15 days.

Under commercial conditions in the Middle West the best results are secured by fattening for about 14 days until the middle of September, and then gradually shortening the period to six or seven days.

The birds ate more feed on three feeds a day but used feed more efficiently when fed only twice.

Gains were produced at 1.89 and 1.41 cents, respectively, per pound cheaper in 1911, and 6.30 and 2.68 cents less in 1912 on broilers than on roasters, in two experiments.

There was great variation in the results secured in fattening. This was due to the difference in the ability of the birds to take on flesh, to their weight, and to the effect of weather conditions. The variation in birds makes their selection in fattening of considerable importance, if the labor of the extra work can be handled economically. The influence of the weather in fattening allows a chance of error in comparing fattening experiments conducted at different times.

The bleach produced by fattening with buttermilk varies according to the amount of milk solids consumed by the birds.

The average cost of fattening hens in November and December was 10.92 and 8.74 cents in 1911 and 10.83 and 10.43 cents in 1912, respectively, per pound of gain at two stations. This is higher than the average cost of fattening chickens for the entire season at the same stations but less than the cost of fattening chickens in November and December. Hens cost 7.7 cents per pound in 1911 and 10.3 cents in 1912, into the feeder, so that their flesh can be bought cheaper than produced at this time of the year. Cheaper gains were secured in fattening hens in 1911 on the rations used in fattening chickens than on a ration of corn chop with 15 per cent of shorts mixed with buttermilk.

Chickens cost 17.6 cents per pound into the feeder, in July, 1911, while the gains cost 7 cents per pound at this time; in November, 1911, they cost 9 cents per pound into the feeder, and gains cost 10.5 cents per pound. This influences the profit in fattening and the best length of time to fatten, making it advisable to feed longer in the first part of the season. The cost of picking, grading, and packing (including freezing) was about 7 cents per head, making the total average cost of a pound of dressed poultry in July, 20.5 cents, which gradually decreased through the season to 13.1 cents in November, 1911.

The best results were secured with the following three rations; No. 1, 3 parts of corn meal, 2 parts of low-grade wheat flour, and 1 part of shorts; No. 2, 3 parts of corn meal and 2 parts of low-grade wheat flour, and No. 3, 5 parts of corn meal, 3 parts of low-grade wheat flour, 1 part of shorts, and 5 per cent of tallow. The same feeding value is secured in a ration of 3 parts of corn meal and 2 parts of oat flour, but at an increased cost of 37 cents per 100 pounds of gain. Four parts of corn meal, 2 of low-grade wheat flour, and 1 of shorts gave very good results during the latter part of the feeding season, or in cool weather; that is, the proportion of corn meal and low-grade wheat flour may be increased in cool weather.

The bulletin goes into considerable detail regarding the average price of grain and buttermilk used in feeding experiments and also gives in detail an account of the equipment, management and methods of feeding. Illustrations are given showing the general arrangement, feed mixers and elevator in the interior of a station; an exterior view of a model well-equipped plant showing complete ventilation which can be easily controlled; and the exterior of a small fattening station with feed-room in the rear. Other illustrations show individual birds which are good and poor types of feeders. A very good feeder has a short, thick head; a poorer type has a crowlike shape head. The bulletin also treats of grading poultry, shrinkage in dressing, initial cost of chickens as affecting profit in fattening, relation of grain fed to manure produced, etc.

THE LAYING CONTESTS.

Editor RURAL WORLD: I dare any man to put up an assertion which is not correct in Rural World and not find somebody to throw a club at him.

My good friend S. R. McConn, of Bates Co., Mo., writes me under date of Jan. 12th: "Two crossbred hens, Barred Rock and white Leghorn, at the Oregon Experiment Station, laid respectively 291, and 303 eggs in the year—champions of all breeds. No. 6,543, ⅝ Leghorn, ⅜ Rock 291, No. 6,521, ⅞ Leghorn, ⅛ Rock 303 eggs in the year."

Let me thank friend McConn for his favor, as the matter had not been brought to my notice, and while he mentions the fact that age is "crowding him to the fireside," he writes an elegant hand and a good letter, and our readers would be pleased to have him contribute an article upon any topic.

Note that classified ad. of Indian Runner Ducks of Mr. Mackey, Pittsburg, Kas. Our Mr. Lyon saw the birds at Kansas City and can vouch for their quality. C. D. LYON.

VALUE OF POULTRY IN KANSAS.

Kansas can increase the value of its poultry products ten million dollars yearly by careful attention to the selection of the breeding stock and to the prevention of disease in the flock. There is not a farm in Kansas where the maximum of production in the poultry industry has been reached. This is due to the fact that the majority of the farmers know little of the details of scientific practical poultry management, says J. C. Werner, director of the correspondence courses at the Kansas Agricultural College.

"We have just formed a practical course in poultrying that will be of interest to the farmer, his wife, the boys and girls, or the expert poultryman," Mr. Werner said. "The texts and bulletins used should be in the possession of everycne who has even a dozen hens. The course is divided into three divisions—incubating and brooding, feeding and housing, and the prevention of disease.

"Poultry is a paying sideline not only for the farmer, but for the man on a small city lot. It sometimes solves the 'boy on the farm problem' where the farmer gives the care of the flock to the boys and they make it a profitable business. The professional man finds it of profit to spend his time in working with a few chickens and it is a fine diversion. At present there is an increased demand for poultry products because of the high price of meat. Tihs correspondence course will teach any one the fundamentals in scientific management of poultry."

FOWLS AND COMBS.

Even some poultrymen have no intelligent idea of the classes of combs on the different breeds of fowls. Four distinct classes are recognized, the single, the rose-comb, the pea-comb and the leaf. The single-comb is the original comb of the ancestors of all domestic fowls. Most double-comb breeds, even at this late day, now and then throw single-comb sports, showing reversion to the original type.

The rose-comb is broader than the single-comb, and has on the upper surface numerous small points, and usually terminates in a spike. The pea-comb can best be described as a combination of three single-combs, attached at front and rear, illustrated by the Brahma comb, although there are several varieties of the pea-comb.

The leaf-comb as seen on the Houdans may best be illustrated by comparing and pressing together of two single-combs at one end, and opening outwardly. Single and rose-combs are more generally seen, but even these vary to a certain degree in various breds. The comb is a good denoter of health or disease.

If red, standing up in normal position, it indicates good condition; but if pale, flabby or abnormal in appearance, serious trouble is present. Every one is familiar with the fact that the comb of a laying hen is redder and has a more characteristic appearance of life than one resting from egg-production.

MONEY ON POULTRY.

The most generally kept farm animal is the hen. Each decade the United States census states that more farms raise poultry than any other agricultural product. While this is true on farms and ranges, it is yet more true in the villages and cities where the census fails to report the agricultural activities. In many small towns nearly every family has a few chickens, although comparatively few possess cows, horses, hogs or sheep.

Furthermore the census states that the products of the hen return a much larger gross income on the investment than any other farm product, the annual income from poultry and eggs sold being over 300 per cent greater than the value of the poultry kept.

Those who are acquainted with the farm conditions know that poultry receives as a rule less care proportionately and has less expended upon it in the way of feed, housing and attention than any other farm live stock. Thus it is clear that poultry also produces the highest percentage of net income, and as a rule the chickens and eggs sold provide the ready money for the maintenance of the farmer's household.

These products are taken to the country store and exchanged for meat, groceries and clothes. In fact, the hen plays a much more intimate part in the rural economic system than is commonly realized. Fortunately, her importance is being recognized.

GRAIN FOR POULTRY.

Corn is more commonly fed to poultry, in the United States, than any other grain; and, when properly balanced with other feeds, is one of the most valuable grains we have. Recent experiments indicate that corn is more easily and thoroughly digested than other grains. For growing stock or laying hens, from thirty to thirty-five per cent of the ration should consist of corn.

Wheat is probably the best grain to feed singly. In Europe and Canada it is more largely fed than any other grain. Wheat screenings, when one can get them clean, are superior to plump wheat for laying hens, as they contain more protein, and are therefore not so fattening.

Oats, being nearest to a balanced ration, should be an excellent poultry feed, but, owing to their thick hulls, they are not much relished by the fowls. By soaking in water, or sprouting, oats may be made very much more palatable.

Barley is an excellent poultry feed; and some poultrymen feed it when they cannot get corn. We find it a splendid grain for fattening purposes, and when cracked it is splendid for little chicks.

Buckwheat and millet make valuable additions to any whole-grain mixture, when fed in moderate proportions.—C. E. Brown, Poultryman, Northwest Experiment Sta. Crookston, Minn.

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CREAM of the DAIRY NEWS

MARKET VALUES OF DAIRY PRODUCTS.

It is important that every dairyman knows how to find the comparative market values of dairy products. A good way to establish an easy working basis is to take 100 pounds of average milk and figure it as local prices.

Computing the price of average 3.5 per cent milk at 5 cents per quart, 25 per cent cream at 40 cents per quart, butter at 25 cents per pound, cheese at 12 cents per pound, and ice cream from 25 per cent cream at 30 cents per quart, with any by-products, such as skim milk or buttermilk, at one-half cent per pound, G. L. Martin of the North Dakota agricultural college figures out these total returns from each form of marketing.

A quart of average milk weighs 2.15 pounds. Then 100 pounds of milk equals 46.5 quarts. The total market value of 46.5 quarts at 5 cents is $2.33.

To find the amount of cream multiply the quantity of milk by the test and divide by the test of the cream. To find the amount of skim milk, subtract the quantity of cream from the total amount of milk. Accordingly 100 lbs. of milk contain 14 lbs. of 25 per cent cream and 86 lbs. of skim milk. One gallon of 25 per cent cream weighs about 8.3 lbs. At this figure 14 lbs. of cream equals 1.68 gallons. Then 1.68 gallons at $1.60 brings $2.69, and 86 lbs. of skim milk at one-half cent brings 43 cents. By addition this gives a total market value of $3.12.

In making butter the overrun usually amounts to about 20 per cent and is to be added to the total amount of butter fat. It is seen that 100 lbs. of the above milk contains 3.5 lbs of butter fat. But 3.5 lbs. increased by 20 per cent overrun gives 4.2 lbs. of butter, and 4.2 lbs. of butter at 25 cents brings $1.05; besides, the 86 lbs. of skim milk at one-half cent is worth 43 cents. Adding these gives a total market value of $1.48.

One pound of butter fat yields about 2.7 lbs of curded cheese. Then 100 lbs. of 3.5 per cent milk yields 9.45 lbs. of cheese. To sell 9.45 lbs. at 12 cents brings $1.13. The whey from 100 lbs. of milk brings 10 cents. This gives a total market value for the cheese of $1.33.

A gallon of 25 per cent cream weighs 8.3 lbs., which will give 1.68 gallons, from 100 lbs. of milk. In making the ice cream the overrun amounts to 40 per cent on the average. With this addition 1.68 gallons equals 2.35 gallons of ice cream and 2.35 gallons at $1.25 is worth $2.82, while 86 lbs. skim milk at one-half cent brings 43 cents. Thus the total market value of ice cream is $3.25.

With the comparaticve market values of products from 100 lbs. of milk, one can readily figure returns from a cow or the herd. This will necessitate a knowledge of the weight of the milk in each case.—G. L. Martin, N. D. Agricultural College, in Breeder's Gazette.

DAIRY POSSIBILITIES.

The population of the United States has practically doubled in the last 26 years. If this rate of inrease continues for the next 25 years we will have nearly 200,000,000 people to feed. Since milk is one of the cheapest animal foods, rightly conducted dairying is certain to be profitable.

There is no line of general agriculture in which well-directed effort will pay so large a profit as in dairy farming, yet its possibilities are little realized. The profits on most dairy farms might easily be doubled. Like any other business, it is made up of an infinite number of small details, and unless all of these operations are conducted on business principles, the best results will not be obtained. The cow is the most economical producer of human food of any of our domestic animals, and as she is the machine for converting crops into dairy products, the surest profit and wisest economy is in securing the best machines obtainable. One cow may not pay for her board, while another, with the same amount of feed and care, may yield a profit of $75 in a year. The wise dairyman keeps the latter kind.—Wilber J. Fraser, Professor of Dairy Farming, University of Illinois.

IMPROVING THE COW.

The Colorado experiment station gives the following suggestion for increasing the efficiency of dairy cows: The dairy cow may often be brought up to a high degree of efficiency by some simple means. The persistency of the milker will pay well for all the extra time spent. Try to make the cow think she has not given enough and she will set about to make it up next time.

A little milk left in the udder will make her think she is giving more than she is expected to give, and at the next milking she will not have quite so much for you. There is a great difference in the per cent of butterfat in the first and last milk drawn. The first will some times be as low as one per cent, and the last has been known to run as high as 12 per cent. It pays to work for the strippings.

The manipulation of the udder will often result in the increase of a pound of milk. This is usually done after the milker has secured all the milk he can by taking the teat in the hand and pushing the udder up close against the body, repeating this about three times with each quarter. Then take each quarter, in turn, between the hands, with the hands close to the body, and rub down.

The extra milk secured at a single milking may not pay for the time, but it will stimulate the cow to give that much more at the next milking without extra work. Here is where the profit will come in.

We all know that a cow with which the calf is allowed to run will very soon adjust the flow of milk to the needs of the calf, and it is equally true that the dairy cow can and will increase the milk flow if encouarged by the milker. Get all the strippings. It will pay.

CONSUMES MUCH BUTTER.

In the last issue of Farm and Dairy is the following relative to the large consumption of dairy products in Great Britain:

The quantity of butter imported into Great Britain in 1912 was 298,-000 cwts., less than in 1911, but, on the other hand, there was an increase of 408,000 cwts. of margarine.

The quantity per head of butter and margarine imported rose from 10.41 pounds in 1891-5 to 13.2 pounds in 1906-10 and 13.1 pounds in 1912.

Supplies of butter from Russia, the Netherlands, France and New Zealand were larger in 1912 than in the preceding year, but were more than set off by smaller receipts from Denmark, Sweden, North America and the Australian states. The shortage of supplies from Canada was noticeable, only 27 cwts. arriving in 1912, as compared with 62,000 cwts. in 1911. The reduction in supplies from Australia was even more marked.

The importation of margarine was the largest on record. All but 38,000 cwts. of the total came from the Netherlands.

The imports of cheese have remained practically stationary, but were rather less (5.7 pounds) in 1912 than in any year since 1889.

The oversea supply of cheese was 40,000 cwts. less than in 1911. Of the total, 1,353,000 cwts. were from Canada and 544,000 cwts. from New Zealand, being less from Canada and more from New Zealand than in 1911. The receipts from the United States dwindled to 21,000 cwts., as against 150,000 cwts. in 1911. Imports from Holland and Italy showed an increase.

EFFECT OF OATS ON FLAVOR OF MILK.

It has been asserted by some dairymen that the feeding of crushed oats to cows will improve the flavor of milk To ascertain the correctness of this theory a series of experiments was made by the Bureau of Animal Industry of the United States Department of Agriculture at the experimental dairy farm at Beltsville, Md. Six cows were used in the experiment; three were fed a grain ration of corn meal, bran, and cottonseed meal; the other three were fed a grain mixture of five parts crushed oats and one part cottonseed meal. A number of samples of milk from the cows fed these rations were submitted to various persons in the dairy division and they were asked to indicate their preference. In all 50 opinions were passed on various samples. Of these, 16 showed a preference for the milk from cows fed on crushed oats, 25 preferred that from the bran and corn ration, while nine expressed no choice. The results show that in these rations, not only was there no marked difference in favor of the crushed oats as a feed to improve flavor, but, if anything, the ration containing bran and corn was more successful in producing a fine-flavored milk.

PROFITABLE FEEDING.

One of the most common faults is to feed too sparingly, in an attempt to make the feed on hand last as long as possible. In some things it is economy to save, but in feeding for milk it is economy to spend wisely. Cows of the right sort which are able to consume large quantities of feed are always the greatest money makers. It is economy to give them all they will clean up well. Under liberal feeding of good producers, it requires around 60 per cent of the feed to maintain the body of the animal and carry on the life processes. In meagre feeding it may require 90 per cent, leaving only 10 per cent for milk production. If this is true, one cow well fed would return as much milk as four meagerly fed. It is certainly greater economy to turn 40 per cent of the feed into milk than 10 per cent, and the latter with a greater amount of labor.

Every pound a cow loses in flesh below good living condition must be replaced by feed later or it will be taken from the pail during the next milking period, and it may be taken with interest. At times and with certain cows, it is possible to overfeed. If a cow is gaining in flesh rapidly, the quantity of feed should be reduced, unless she needs to gain. Unless she is fat, it is a mistake to cut a dry cow down to the minimum. If she has been bred as she should have been, the calf is maturing rapidly at this time, and it is at this time that the cow should build up for the next year's work.

However, quantity alone is not sufficient. A cow may be given all she can consume and still lose in milk and flesh. The quantity she will consume and the efficiency with which she uses it depend feed. The speaker fed two lots of cows all they would consume. One lot consumed 13 per cent more feed and gave nearly 34 per cent better returns per 100 pounds consumed than did the other lot. Besides this, they held their own in flesh, while the other lot lost rapidly in flesh and condition and came out of the experiment thin and in poor condition. Both of these rations were made up of common farm grains, except that one contained gluten feed (which is a corn product). Per ton, there was little if any difference in the cost of the two rations. This shows that it is poor economy to depend on quantity alone.—Prof. C. C. Hayden, Ohio Exp. Station.

RAISING FALL CALVES.

The first requisites in raising fall calves are clean, dry, well ventilated, sunny pens. Young calves never do well in damp, dirty quarters. A good floor made of cement or cork brick, well bedded with short straw, shavings or sawdust to absorb the liquid manure, will facilitate cleaning and keep the calves warm. A wood floor does fairly well if the joints are laid closely and then treated to a coat of creosote to prevent the absorption of liquid manure; otherwise good wood is very unsanitary. A floor of earth is practically useless, as it cannot be kept clean and sanitary.

Good fresh air in the calf stable is of great importance with the young calf to give it a strong, vigorous constitution and strong vitality. The calf will be the dairy cow within two years, so if good, productive dairy cows are expected the calf needs to be kept strong and thrifty from the start.

Sunshine is very necessary to the vigor of all young growing animals. It is an excellent germicide and for that reason serves to purify the surroundings and to keep the young calf healthy. It is always well to place the calf pens in a part of the stable where plenty of direct sunshine may enter.

The advantage of raising fall calves is that dairy products are much higher priced in the winter, the average farmer has more time to properly care for the cows, and the average cow will maintain her milk flow longer by coming on to grass in the springtime. With the calves coming in the fall, they are ready to be weaned in the spring and can be put out to pasture where they will continue to grow. On the other hand, when calves are dropped in the spring they are ready to wean in the fall about the time winter sets in, so are liable to go through the winter without making very much growth. In the fall is by all means the best time for dairy calves to come, both from the standpoint of the calf and profits of the owner.—G. L. Martin, Prof. of Dairying, N. D. Agricultural College.

THE COST PROBLEM.

The value of a cow's products should pay the cost of feed, the labor or caring for her even though no help is hired and at least 6 per cent interest on the capital invested, that is on the value of the cow and the cost of sheltering her. Feed, labor and interest for the average cow kept in the northern states amount to $50 a year at the lowest estimate.

It may be said that the sales from the average cow, or rather the value of her product, should be at least $50 per year. It should be this amount to break even. It should be more than this to make dairying as profitable as it must be to interest and hold the northern farmer. It must be more than this to build up the farm and make the buildings more comfortable and the hours of work more reasonable.

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SHORTAGE OF 18,259,000 MEAT ANIMALS IN UNITED STATES.

The indicated total shortage of meat animals since the census of 1910 is nearly 9 beef cattle, 7 sheep and over 3 hogs for each 100 of the total estimated population of the United States in January, 1914, according to the estimates of the Department of Agriculture just published in the Agricultural Outlook. This means that it would take 18,259,000 more meat cattle, sheep and swine than the estimates show at present in this country, to give the present population the same meat supply that the census of 1910 showed to exist.

These estimates are based upon reports and estimates from the Department's field and State agents and county, township and special correspondents, who have reported on practically every county in the United States. The figures moreover have been compared with those of the census of 1910 and with the records of tax assessors in the various states as far as they are available. The Department therefore believes that these figures represent the best information obtainable on the numbers and value of live stock, including meat animals.

The estimates with regard to meat animals, that is, cattle other than milch cows, and sheep and swine, indicate a steady and fairly uniform decrease in the number of meat cattle and sheep and a slight increase in the number of swine.

The shortage of meat animals is probably due to a number of contributing causes. Some of the more important of these are:

The encroachment of farms upon the range territory.

The lack of a proper range leasing law permitting economical management and utilization of ranges.

The shortage in the corn and forage crop due to the severe drouth in Kansas, Nebraska and Oklahoma in 1913, which caused the farmers in those states to dispose of their meat animals.

The increase in the value of land and the increased cost of labor and stock feed, resulting in greatly increased cost of production.

The decline in stock raising on farms in the East and South because of poor marketing facilities, resulting from many local slaughtering establishments having been driven out of business by the competition of the great central slaughtering establishments of the West and Central West.

The temptation to sell live stock at the prevailing high prices rather than to continue to carry them with high-priced stock feed, possible loss from disease or accident, and uncertain prices the following year.

Enormous losses from hog cholera.

The competition of higher prices for other farm products.

The extent of the influence of these various causes of shortage singly or combined is not definitely known and will undoubtedly be considered by the committee recently appointed by the Secretary of Agriculture to investigate the economics of the present meat situation.

The large increase in the value of meat animals on farms is probably accounted for by the increased cost of production and the increased consumption or demand arising from the fact that production has not kept pace with the increase in population, and in the case of cattle and sheep has actually declined. It is well known that producers of farm products are the last to receive any benefit from higher prices paid by consumers, yet they are among the first to increase production if there is a prospect of realizing better returns. The very fact that there is a present shortage of nearly 19,- States since the census of 1910 indi- 000,000 meat animals in the United cates clearly that the business is not profitable to producers; otherwise every farmer and stock raiser in the country would have increased his herds of meat animals. It should also be borne in mind that the estimated average value of meat animals is their value on the farm, and not the wholesale or retail value. The farm value, or average prices received on farms, is much less than the wholesale prices and considerably less than the retail prices to consumers.

Just what the difference is between the price at the farm and the cost to the ultimate consumer are not definitely determinable at this time. The total cost to the consumer is made up of the cost of production of the live stock (farm price), the cost of marketing and transportation of the live animals, the cost of manufacture into various kinds of meats, and the cost of marketing and distributing the manufactured products to the consumer.

The estimates indicate that the number of milch cows on farms in the United States is now 20,737,000, an increase of about one-half of one per per cent over the census figures of 1910. Meanwhile the average farm price for milch cows has increased from $35.79 in 1910 to $53.94, or an increase of 50.7 per cent. On this basis the farm value of milch cows now in the United States is estimated at $1,118,487,000 as compared with an estimated value in the census year of $738,184,000, an increase of $380,303,- 000, or an average annual increase for four years of $95,075,000.

The estimates for January 1, 1914, indicate that there are 20,955,000 horses and 4,447,000 mules on farms in the United States, an average annual increase of about 1.4 per cent over the number shown by the census of 1910. It is estimated that the average farm price of horses has increased from $108.19 in the census year to $109.33 in January, 1914, and in the case of mules from $119.84 to $123.84 in the same period. On this basis the total farm value of horses is $2,291,- 000,000 and of mules $550,697,000. The total estimated farm value of these animals is therefore $2,841,697,000, which is an increase of $191,454,000 over the census year and represents an annual increase of wealth from these sources of $47,863,000.

EDUCATION AND BUSINESS METHODS COUNT IN SUCCESSFUL FARMING.

Farmers with a high-school education make nearly double the average income of those with merely a common school education, and those who start earliest make the most profits, according to the Department of Agriculture's investigators. The Department's Office of Farm Management has been conducting a series of investigations in the corn belt, which have brought out many details that should be of practical value to all agriculturists. These results have just been published in a new bulletin.

Under average conditions the farm, according to this bulletin, is no place for the weak or for those unable to direct work. The man who intends to spend his working life in the country should start early, for success is not gained in a moment but by many years of persistent effort. It is true that some farmers have made small fortunes in a short time, but this is usually through a phenomenal rise in land values. Few men have become rich from the real profits of the land. Those who have done so usually needed a lifetime in which to work. Through skill in management and by hard labor a comfortable living and moderate profits may be expected. Those persons who are turning to the farm with the idea of reaping large incomes are doomed to severe disappointment.

Those making the poorest incomes were 28 years of age when they started farming and were past 30 when they became owners. On the average the oldest men are making the least profits.

Many farmers with very little schooling succeed, but these same men would do better if they had the opportunity of further training. No one ever hears a farmer regret that he spent a part of his early life in school.

The way one act in the sick room has an important bearing on the condition of the patient. Be clean and neat in dress, punctual and pleasant, and speak with a low, soft voice—but do not whisper. Do not bring the unpleasant happenings into the sick room. Keep the family troubles in the barn, if need be.

MEETING OF AMERICAN MULE FOOT HOG RECORD ASSOCIATION.

At the recent annual meeting of the American Hog Record Association, held in Columbus, Ohio, John H. Dunlap of Williamsport, Ohio, was elected president; Prof. C. W. Burkett, of New York, was elected vice-president, and Robert E. Pfeiffer, of Columbus, Ohio, secretary.

Applicants for membership are coming in from all over the United States to the association, and the future seems very bright for this association, whose management is composed of men of experience and ability.

Mr. Dunlap is the largest breeder of this hog, and has spent a great deal of time and money bringing them before the people through the farm press, and by exhibiting them at state fairs. He was the first breeder to advertise the Mulefoot exclusively, and has made sales in every state and in foreign countries.

This association issued two herd books last year and is now recognized as the leading record for this breed. It has members all over the United States, and the appointment of Mr. Dunlap on the Live Stock Record Board of the Panama Pacific Exposition will bring the merits of this breed before all the world at the great exposition.

CORN GROWING IN KANSAS.

Kansas needs a revival in corn growing, the agricultural college has decided. The state grew its smallest crop in years last season. Of course the unfavorable season largely was responsible for the unusually low yield, but even in good years Kansas isn't doing its best with corn. Wherefore, the agricultural colleges has asked Kansas people to set apart this month as "corn month" in Kansas. Everybody is to talk better corn. Every organization that meets in February will be asked to have a "corn program." The extension division of the college is urging proper observation of "corn month." The college will send speakers, bulletins and circulars to aid in the corn revival.

"Corn is the commercial barometer for Kansas," said J. H. Miller, dean of extension work at the agricultural college. "We can talk as we please about wheat and brag big about alfalfa, but after all we must admit that 'corn is king.' Therefore the agricultural college is asking everybody to study corn and sorghum for the month of February. It is asking every farmers' institute and every grange and every commercial club and every organization in the state that is interested in agriculture, to study how to get a better quality and a bigger crop and also the best way of marketing the crop. This last season was a hard one, but possibly we may have learned one or two lessons on seed-bed preparation, seed testing, cultivation, that will help in the work this year."

KING SYSTEM OF VENTILATION.

It makes no difference whether the air intake flues are located on the outside or the inside of the barn or in the wall itself, so long as the aperture into the stable is a sufficient amount higher than that on the outside of the stable to prevent the warmer air of the stable from passing down through it, says the Michigan Farmer. In some cases where double windows are used in a basement stable the intake flues are made in the casing between the windows, and flues of this kind seem to answer every purpose. It is better, however, to have the intake flues on two or more sides of the stable, in order that those on the side from which a strong wind is blowing may be cuosed or partially closed during very cold weather, although this is not essential if they are properly constructed. This would be less essential if the intake flues extended nearly to the ground on the outside than if they opened on the outside above the four-foot wall and on inside of stable at or near the ceiling, although this latter arrangement would be quite as efficient as where the intake flues are located in the window casings. The intakes should have an aggregate capacity equaling the capacity of the outtake flue, and the proper capacity of the outtake flue will depend upon its height as well as upon the number and and kind of animals kept in the stable. Prof. King laid down the rule that where the outtake flue has a height of 30 feet the aggregate capacity of outtake and intake flues should provide not less than 30 square inches per head for horses and cattle. Each 10 feet more or less in height, within reasonable limits, is estimated to make a difference of six square inches in needed capacity per head. Supposing the outtake flues to be 40 feet high, to measure up to Prof. King's standard, 24 square inches in cross section capacity would be required for each animal, or a total cross section area of 376 square inches for the 25 animals to be kept in this stable. Supposing the two outtake flues of 16 inches diameter are square, they would have a total cross section area of 324 square inches, or a little less than two-thirds the ideal for perfect ventilation as described by Prof. King. There is no doubt, however, that with ventilating flues of this capacity a stable would be ventilated much better than would be possible by means of any other system of ventilation without too great a lowering of the temperature of the stable. In case the two flues already in do not prove adequate, another can be added later.

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COSTS IN FEEDING LIVE STOCK.

The grain and other feeds grown on the farm, where they are fed, should be charged to stock at the market value at the farm, which is the price at the elevator, minus the cost of hauling. This is the result of seven years' experience in studying Farm Cost Accounting problems in the Section of Farm Economics.

The object of cost accounting is to show an analysis of the entire farm business; and the relative profitableness of each enterprise, as well as the relative costs, should be made clear. If the farmer is to learn the truth about the cost of his corn, oats, hay and other feedable products, he must do considerable figuring and have a good understanding of farm cost accounting methods. On the other hand, the market values of grains and other feedable products serve as a common standard from which any farmer may easily figure the cost of feeding them to live stock. The market price at the farm is the only logical, as well as the easiest, method to follow. If live stock is essential for profitable farming in so many sections, why should the live stock enthusiasts figure to eliminate the profits of crop growing, so that the live stock may appear more profitable —C. M. Bennett in Government Report.

The northernmost national forest is the Chugach in Alaska; the southernmost is the Luquillo in Porto Rico.

For shingles alone, 750,000,000 feet of timber is cut in that part of the state of Washington which lies west of the Cascades.

FARMERS' INTEREST RATES.

Why Farmers Pay More for Money Than Other Men.

To Farm and Fireside Judson C. Welliver contributes an article showing how farmers have to pay high rates of interest in this country because they have no system of collective credits such as they have for the benefit of farmers in certain foreign countries. The substitution of community credit for individual credit is what always reduces rates of interest. Cities borrow their money at lower rates of interest than individuals because they act as a community. Following is an extract from Mr. Welliver's article showing the rates of interest farmers pay in this country at the present time:

"Recently the department of agriculture investigated interest rates paid by farmers all over the country. It was found, through statements made by several thousand banks in answer to questions, that on all loans to farmers, secured and unsecured, the average rates run from a trifle under 6 per cent in most of New England, New York, Pennsylvania and New Jersey up to 10.57 per cent in Oklahoma, 10.57 in New Mexico, 10.15 in Arizona, 10.13 in Montana, 10.70 in North Dakota, 9.97 in Texas, 9.48 in South Dakota, 9.98 in Georgia, 8.80 in Florida, 6.23 in Ohio, 6.47 in Indiana, 6.31 in Illinois, 6.88 in Michigan, 6.24 in Wisconsin, 7.93 in Minnesota, 7.21 in Iowa, 7.28 in Missouri, 6.86 in Kentucky 8.28 in Tennessee, 8.26 in Mississippi, 8.33 in Louisiana, 9.67 in Arkansas, 9.37 in Wyoming, 9.24 in Colorado, 8.61 in Utah, 9.03 in Nevada, 9.92 in Idaho, 8.99 in Washington, 8.32 in Oregon and 7.44 in California."

SHALL THE FARMER DIVERSIFY?

This subject has been discussed before farmers' institutes at various times and no doubt interest therein will increase from year to year. I have spent a good deal of my time in the past six years in the fruit business and have made an exhaustive study of the subject. The great trouble in the Mississippi valley states as in a great many other sections is the one-crop system. There are perhaps some individuals who can make a success growing corn. At the same time, I know of numerous men who have made fortunes growing wheat and quite a few who became wealthy growing apples. But these men are speculators or plungers, and for every one that scores a success hundreds have failed. A one-crop system of farming is a gamble, and like roulette, racing or rum, it will get the best of any individual who follows it exclusively long enough.

This statement will, of course, be disputed by those who have all their eggs in one basket. They hate to admit that the handle may break. But at the same time there is a distinct line of demarkation between cost of production and profit, and whenever this line is over-reached production stops. Any system that tends to cheapen production must be looked upon with favor. The surest step toward cheapening production is to diversify. Grow less of one crop and more of several crops. If you have been growing corn and wheat, grow less of these commodities and more of apples and berries. It is true, if you grow apples you have to spray; it's also true if you grow corn you have to cultivate. Spraying is only another word for cultivation. I have nothing to say against the river bottom corn specialist, but for the average farmer, those who make their homes upon the farm and rear their children there, the cream of American citizenship, I wish to say specialize in corn, wheat or hogs if you will, but whether you have five acres or fifty, plant not more than half your land to grain. Put a portion of the rest into orchard and berries and grow enough alfalfa to support as many pigs and cows as you can well handle. Add to this a good bunch of poultry and several stands of bees and you are assured a good living, a steady income the year around. Your labor will be most evenly divided and you can become rather independent of market conditions.

With only corn and hogs, you may have a drouth, and lost your hogs through cholera. At the best the sales are usually made through the fall and early winter. There is a long period when it "is all going out and nothing coming in." On the other hand, a given amount of money coming in regularly the year around is bound to do you more good than if handed to you in a bunch once a year.

If you could wake up in the morning and find a five-acre patch of strawberries on your farm that was sure to make you $1000.00 next spring you would wear the smile that won't come off. If you could go out there on that hill tomorrow and find an apple or peach orchard all nicely pruned and sprayed and sure to net you $2000.00 next summer, you would not have a worry. You say the orchard may fail, the frost may kill the strawberries. Granted. Also the corn may dry up for lack of moisture and the smut spoil your wheat. But nature seldom gives us a shortage in all crops and where we fail on one we may win on another.

The time is coming and not far distant when the farmer will more and more diversify, for the farm is the basis of all business, the keystone of prosperity. The farmer feeds them all. You cannot feed them entirely on corn, wheat and bacon. Give them, the consumers, a balanced ration, so to speak, by throwing in now and then a dish of strawberries and cream or a big red apple.—S. H. Burton.

SETTING FENCE POSTS.

It is a common belief among farmers that a post will last longer if set in the ground the reverse of the way it grew in the tree, in other words, with the butt end up. Accordingly, one sees many posts, especially end and gate posts, with the small end down. The supposition is that sap in a tree is always ascending, or at least that it is easier for the sap to go up than down.

Consequently, it is argued, turning a post upside down tends to prevent the rise of water, helps to keep the wood dry and therefore renders it less liable to decay. As a matter of fact, sap or water will flow in either direction with equal facility, and the popular notion to the contrary is incorrect.

Careful experiments on the relative durability of post timbers have been made by the Ohio agricultural experiment station, and the above question was considered. One fence in particular contained 156 black locust posts, of which 86 were set with the top end up, 39 were the top end down, and 31 did not show in what position they were set.

At the end of 20 years 30 posts, or 19 per cent, were decayed. Of this number 15 were top up, 13 top down, and 4 undetermined. In other words, one-third of those set top down rotted off, compared with only a little over one-sixth of those set top up. From this and numerous other observations the conclusion was reached "that there is no difference which end is put in the ground, except that the sounder or larger end should have the preference."

The decay of a post is mostly at the ground line, since it is there that the conditions of air and moisture are most favorable to the development of rot-causing fungi. Other things being equal, the larger the post the longer it will last.

Inverting a post often means putting the small end in the ground, and where this is done, the time required to rot it off is less than where the big end is down. If both ends are equally sound, the larger should go in the ground. If one end is defective, it should be up, since the conditions above ground are much more favorable to durability than just at or below the ground line.

There are 36,500,000 young trees in the government's forest nurseries.

Two tons of cascara bark have just been sold from the Siuslaw national forest, Oregon, at one cent a pound.

Weekly Market Report

FAIR OFFERINGS OF CATTLE—MARKET SLOW—HOGS ARE FAIRLY ACTIVE.

CATTLE—But few good beef steers were offered, the bulk of the run being of medium grade. Practically no choice steers were available. Despite the fact that there was only a moderate offering, the market showed very little signs of being on a strong basis, as the session was slow right from the outset. There was little to choose from as far as quality was concerned and buyers manifested no great interest in absorbing the showing actively, but seemingly preferred to take their time. While the market was slow and the feeling rather weak, no material changes were evident regarding prices and the bulk of the showing cleared on a steady basis, although there was complaint in spots that prices were slightly lower. The top was $8.60 and bulk went at $7.50@8.10.

Supply of cows and heifers was moderate. Demand was fair, as packers and butchers were operating. However, market reflected scant improvement over the close of last week, as while heifers moved a little more freely, prices were on about the same basis and looked steady throughout. There were few choice heifers on sale, best straight loads clearing at $8.25 and bulk of desirable grades going in a range of $7.50@8.

A good sprinkling of choice beef cows offered and with a good demand, market was fairly active and prices steady. Medium-grade cows were generally steady, although in places sellers complained of a slow, easy market. Canners and cutters were unchanged.

Stocker and feeder market continued to reflect a good, strong tone. Supply was only moderate and while demand direct from the country was again rather light, local traders were active operators and competition between these elements was good. A couple of bunches of good grade stockers sold at $7@7.10, and bulk of feeders went at $6.25@6.60. Demand for she-stuff was fairly good, and with only a small supply, sellers found little difficulty in placing their holdings at fully steady prices. Yearlings were in good request and sold steady, best kinds reaching $7.75.

Offerings of Southern cattle amounted to 75 loads. The bulk of the showing came out of canners' territory, although there was a fair supply of Oklahoma steers. There was only a fair demand for the steers, packers securing the bulk and a lack of support from order buyers being felt. Prices on the steers were 10@15c lower. The showing cleared in a range of $6.85@7.35. A load of mixed stuff from Oklahoma was also received. Best cows and heifers and grown canners reflected slight change. However, there was some complaint toward the close that prices were a shade easier. Yearlings and heretics continued on the downturn, bulk selling 15@25c lower.

HOGS—A good demand for the better classes and the trade opened on a 5@10c higher basis, most of the hogs showing but 5c advance, but later in the day the market was back to the Saturday basis, and that is where it closed. Several loads of good hogs of medium and heavy weight brought $8.70, which was the top of the market, while the bulk of the hogs went at $8.40@8.60.

The top showed to be 5c better than the top in Chicago, and therefore the highest in the week. The top in Chicago was $8.65 and a good big lot of the hogs here brought that price or better. It was the strong shipping demand that caused the good prices. Packers were not very brisk in their demands and waited until the others were through before they made much of an attempt to do business.

Good hogs around 200 pounds and over that suited shippers and butchers sold mainly at $8.57½ and upward, while fair to good mixed and plain grade medium and heavy hogs sold at $8.30@8.55, which is much the same as they were paying on Saturday.

Good lights and pigs found a right good market, but the poorer grades were not any better sale than they were last week. Best lights under 165 pounds sold at $8.10@8.40, fair grades $7.25@8, best pigs weighing less than 125 pounds, $7.75@8.10; fair grades, $7@7.65, and the poorer kinds at $6@6.85, with some of the real trashy offerings under $6. Some few of the poorer kinds were unsold at the close.

SHEEP—Although there was but a small supply of sheep and lambs, the market was on a lower basis. A few sales were not more than 15c under the close of last week, but most of them showed a loss of 25c and it was a dull trade. No sales were made until rather late in the day, as the sellers and buyers were unable to get together.

Several loads of lambs were received direct from Colorado and then there were several loads of Western sheep and lambs that were fed in local territory. A few of the best lambs offered brought $7.75, while the rest of the good lambs sold at $7.50@7.60. Lambs that were but fair went at $7@7.40 and some even lower than this. No yearlings were offered, but the general impression was that had there been any on sale they would have sold pretty close to 25c lower.

Sheep were pretty scarce but most of them sold on a lower basis, the decline was about the same on lambs. One lot of choice Western wethers sold at $5.60 and another lot went to an outside buyer at $5.50, but regular packers were not paying above $5.25 and some plain sheep sold at $5. Stockers and choppers went at $3.75@4.40 and bucks at $4.25@4.50.

Horses and Mules.

HORSES—The estimate called for 2200 head of horses and this run may be compared with 3650 head a week ago and 1500 head a year ago. Receipts during January showed an increase of 2200 head over the corresponding month a year ago.

There was a good active trade in evidence from the eastern states, who were calling for a good supply of the quality kinds of chunks and drafters and for these they paid better prices all the way through. The Southern trade was active as there was a good attendance of purchasers from this division and they were showing some activity in taking hold and paying for their supplies at prices satisfactory to shippers.

MULES—There was a light demand for the big, quality kinds of heavy mules, but this was rather limited and not many sales were negotiated, but in cases where these transactions were made the prices were on a steady order. The best demand came for the good, fat quality cotton mules and these were going fairly well with prices fully steady with last week. Any kinds that had the fat and quality were the ones that sold steady.

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WINTER WORK IN ORCHARD.

What are you doing in your orchard this winter? At the Fruit Experiment Station at Mountain Grove, it is believed that some of the most important work of the whole year can be done during the winter season. It is the time when the trees may be closely examined for serious pests, diseases or other tree troubles and it is also the time when you can best spare the labor. In an examination of the trees at this season, when the defects are not hidden by the foliage, it is easy to locate and treat the cankers which threaten the life of the trees. There will be noted some limbs which are dead, some which were badly broken at picking season and others which are dead or dying from old age, disease or sunscald. In nearly all these, close examination will disclose minute holes about the size of number eight shot, marking the presence of the fruit bark beetles or as they are often called the "Shot Hole Borer." These tiny pests prefer to winter over in branches which are weakened or dying and in such limbs may sometimes be found by thousands awaiting springtime to spread their activities to other limbs about them. Some of our winter birds assist greatly in the work against these pests. and during the present winter at the Experiment Station at Mountain Grove the Ruby Crowned and Golden Crowned Kinglets, the Downy and the Hairy Woodpeckers and the Chickadee have been observed digging these pests from beneath the bark. It goes without saying that all such dead and dying branches together with those affected by serious diseases such as canker and the like should be cut out and burned during the winter. While you are about it now is a good time to burn that "brush heap" where you have been throwing the "prunings" for the last few years and thus rid your orchard not only of the bark beetles and other insects hibernating there but also of a source of black rot, brown rot and kindred fungus troubles.

Winter also offers a splendid time for work against the "borers" and these should be "wormed out" thoroughly. This worming should be carefully done, however, using care to avoid girdling the trees, cutting across the grain as little as possible and using a rather stiff, sharp pointed wire in place of the knife when possible. The larvae of the codling moth together with numerous other pests and insect eggs finds shelter under the rough cakes or bark on the tree trunks and by scraping these with an old hoe we may expose the pests to their natural enemies and to the effect of the spray when applied in early spring. In your examination of the trees keep a close watch for signs of scale insects, not only on the trunks and larger branches, but also on last year's twigs. Look over your spraying machinery and see that everything is in working order before the rush of spring work. See that the engine is in good order, the relief valves working and the poles and nozzles cleaned ready for use. Plan your schedule of sprayings for this year and order the necessary materials for your spray mixtures. If you do not feel certain as to just when to spray for the different troubles in your orchard, write to the Missouri State Fruit Experiment Station at Mountain Grove, telling just what troubles you wish to work against, and they will gladly help you plan your work.

POTATO SPRAYING.

In a Canadian experiment potatoes sprayed with Bordeaux mixture yielded 279 bushels per acre. Those sprayed with Paris-green yielded 252½ bushels per acre, but in the latter case there were rotten potatoes to the extent of 10 bushels per acre, while there were no rotten potatoes in the plots sprayed with Bordeaux.

Deducting 10 bushels of rotten potatoes, the yield of potatoes from the plots sprayed with Paris-green was 242½ bushels per acre. The increase per acre from spraying with Bordeaux was 36½ bushels. These potatoes were sprayed on the following dates: July 19th, July 30th, August 14th and September 7th.

Averaging the quality of material used on these potatoes for the four sprayings, it requires three barrels of the mixture to cover an acre at one spraying, therefore the amount of Bordeaux required on one acre for the season was 12 barrels, costing as follows: 48 pounds of copper sulphate at 11 cents, $5.28; 48 pounds of lime at four pounds for 10 cents, $1.20.

The increased cost of using Bordeaux rather than Paris-green was $6.48 per acre. No account for labor or for Paris-green is charged against Bordeaux-sprayed potatoes, because it takes practically the same time to spray an acre with Paris-green solution as it does with Bordeaux, and the same amount of Paris-green is required in both cases.

CHINCH BUGS BEST DESTROYED DURING WINTER MONTHS.

The chinch bug, which in sixty years has probably caused loss considerably in excess of $350,000,000 to American farmers, is more effectively destroyed during the winter months than later when it has left its winter quarters, according to the Department of Agriculture. The burning of dry grass, leaves and rubbish along the margin of woods and fields is the best method of destroying the pest at this season of the year.

The pest, which is distributed generally throughout the United States except in the extreme west, has caused particular damage to the staple grains throughout the middle west. The greatest losses from the insect are suffered in Ohio, Indiana, Illinois, Kentucky, North Carolina, Missouri, Iowa, Wisconsin, Minnesota, Kansas, Nebraska, Oklahoma and Texas. The fact that this bug causes such widespread depredations makes this warning for its destruction during the winter of very general importance.

The chinch bug when full grown is only about one-fifth of an inch in length and may be less. It may be described as black with numerous hairs, also black. The underwings are white. There are two forms of the fully developed insect, one with long wings and the other with shorter wings. The short wing form differs very much in its habits from the long wing form, the first passing the winter in the meadows, which it usually attacks in preference to grain crops. The other kind may be observed flying about during Indian summer in search of winter quarters. The short wing insects are not able to fly and therefore cannot make such extensive migrations to and from winter quarters. The chinch bug with the short wings is found in abundance only in the east. The more dangerous long wing variety ranges over most of the country between the Rockies and the Appalachians.

Pasturing sometimes aids in the destruction of the chinch bug. This is particularly effective to the northward in the middle west when the grass is green and matted or occurs along hedge rows and rail fences so that it cannot be burned. Leaving the ground bare of vegetation permits the bugs to be exposed to the winter weather, and this kills them. It is possible to clear out hedge rows and along rail fences, piling the refuse to one side where it can be burned later.

These measures should be carried out sometime between now and spring (the earlier the better) before the chinch bugs leave their winter quarters and take themselves to the fields. In the southern part of the middle west the burning is not very effective if done after February 1st and is very effective if done in November or December. Along with these preventive measures, all grass growing on waste lands should be burned and especially clumps of broom sedge in pastures and similar localities.

It is most advisable to get rid of the chinch bug before they enter the young wheat in the early spring. Once they have reached the wheat they are not readily accessible. Most of the bugs spend the winter in the thick bunches of clump-forming grasses in waste places, pastures and meadows, along road sides and railroad rights of way. During late fall and early winter great numbers of living bugs can be found in corn husks, piles of kafir, corn, etc. In the spring, however, very few living bugs but many dead ones may be found in such situations. This seems to show that the current belief that most of the bugs pass the winter beneath such refuse has no foundation in fact.

It is very important when grass is burned that it be dry and yet burn slowly so that the heat will penetrate the denscest portions and reach the bugs. The bugs need not come in direct contact with the fire. This burning in early fall and late spring is not as effective as when done during the winter, for green and wet stems in the former seasons furnish protection to certain of the bugs. Even the most careful burning will not reach the bugs under this condition.

An important item in the destruction of these pests is the co-operation of all the farmers in a neghborhood. It is really an easy matter to fight this pest if a whole neighborhood undertakes it.

Few insects have caused such enormous looses as have the chinch bug. It is the most fatal pest that attacks our corn, wheat and other staple grains. If it were not for the extreme susceptibility of the very young bugs to destruction by drenching rains and for the fatal effect of certain parasitic fungi on both the adults and the young, the practice of raising grain year after year on the same area would become altogether unprofitable in the United States.

The Department of Agriculture furnishes, on application, two pamphlets regarding this dreaded pest. One is a circular entitled "The Chinch Bug," and the other "Chinch-Bug Investigations west of the Mississippi River."

VALUABLE LAND FOR FARMING IN ALASKA.

So far as topography, soil, and climate determine the matter, Alaska has probably 100,000 square miles of area on which there are possibilities for farming and grazing. The larger portion of the farming land is in the interior, in the Yukon drainage, according to the Department of Agriculture's new bulletin entitled "Possible Agricultural Development of Alaska."

Currants, raspberries, gooseberries, strawberries, blueberries, and cranberries are plentiful in Alaska. Varieties of wheat, oats, rye, barley, potatoes and many other vegetables have matured every season since the Department started its work at its two most northern experiment stations. The Department has four stations; one is on the Yukon, within 75 miles of the Arctic circle, another is also in the interior, while there is one in the southern and another in the southwestern portion of the territory.

It has been positively demonstrated that forage crops may be grown in the southwest and central portions as well as potatoes and other garden vegetables. Chicken raising is also proving feasible. It has also been estimated that a great number of farm products are shipped in that might easily be raised on the ground.

The new bulletin on Alaska, while citing so many optimistic facts, also warns the homesteader that there are many difficulties to be encountered.

On the south coast, where the climate is mild, tillable land is scarce, because of the proximity of the mountains to the shore line; elsewhere in Alaska the winters are long and very cold and frost-proof buildings must be provided for shelter of family and stock.

The ground freezes to a great depth and there is but a short period during which this can thaw, and the surface is covered with an accumulation of undecayed moss and other vegetable material serving as a protection to the frost and a reservoir for moisture. The frost line under natural conditions sinks but a few feet during a season, and the thawed layer is usually a morass of muck in all portions of Alaska where tillage is possible. This condition makes land travel almost out of the question during the summer until wagon roads shall have been built, and these must be largely of the corduroy type. Meantime the farm home must generally be located close to navigable water.

The swampy character of much of the surface of Alaska makes it a great breeding ground for mosquitoes and gnats, which are almost intolerable pests to both man and beast. It also makes drainage a prerequisite in order to remove the surplus water so that the land can be worked, raise the temperature of the surface soil, lower the frost line, facilitate the decay of the accumulated organic changes which will transform the soil matter, and bring about chemical from a very acid condition to one much less so. Nature requires much time for this last process.

Where the vegetable accumulations are largely moss, this must be destroyed, either by burning or by carting it from the land, for if plowed under it decays very slowly and seems to have an injurious effect on most crop plants.

ROOTS.

Roots are excellent feed for dairy cows and are especially desirable for the fall and early winter, as they are palatable, easy to digest, and stimulate the flow of milk. They are especially effective with cows that freshened in the spring, and whose flow of milk has been depressed during the summer because of annoyance by flies and mosquitoes and unfavorable pasture conditions. If such are given a liberal supply of roots when brought to stall feeding, the flow of milk is often materially increased. Less grain is required while roots are being fed. The change from roots to more grain should be made gradually, adding grain at the rate of 1 pound for 10 pounds of roots withdrawn.—T. L. Haecker, Division of Dairy and Animal Husbandry, University Farm, St. Paul.

Rex J. Davidson has just completed a corn variety test in Montgomery county, Iowa. Seed corn from 70 different farmers was used in this test. A difference of 15 bushels per acre was found in the plots. Farmers of the county were much interested in the result of the test.

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The Pig Pen

HOW HOG CHOLERA IS BEING COMBATED.

The Department of Agriculture, during the past year, has been conducting campaign in Indiana, Missouri, Iowa and Nebraska to control the contagious disease of hogs known as "hog cholera" by means of anti-hog-cholera serum and farm quarantines. In one county (Pettis county, Missouri) where there was a loss of 18 per cent in 1911 and 25.6 per cent in 1912 of all hogs raised, there was only a loss of 14.7 per cent up to November, 1913. This decrease was due to the use of the serum, which, although not used there by the department's agents until August, 1913, materially reduced the loss. About 60,000 hogs were raised during the past year and of the 10,000 that died of the hog cholera only about 1,000 were lost after the active use of serum and quarantine measures were inaugurated.

In every county where these measures were employed, even though begun after the disease had continued its ravages for some time, there was less loss from hog cholera than in either of the two preceding years.

In addition to its great function as a preventative, it has been found that the anti-hog-cholera serum would cure a large proportion of hogs in the early stages of the disease and render them immune after recovery. However, if hogs are not treated by this serum, from 75 to 100 per cent of all affected herds die. This serum, so far as is known, is the only thing that will prevent the disease.

Of hogs actually sick when treated, the department's inspectors lost but 25 per cent during the past summer. Of well hogs in diseased herds, 2.8 per cent died after being treated, and of hogs in exposed herds less than 1 per cent died after being inoculated with the serum. In an infected herd there is always a certain proportion of hogs that are well.

The inspector examines the hogs when he arrives, takes the temperature of all hogs in the herd and separates the sick from the well. The temperature is an indication of the sickness. The temperature of a sick hog, unless the hog is near death, will run above 104 degrees and sometimes as high as 107 or 108 degrees F.

Some states are engaged in the manufacture of serum to cure this disease. This serum requires special treatment to preserve its quality and a qualified man to produce it. Sufficient serum to treat an average hundred-pound hog costs about thirty cents at a liberal estimate. The treatment is by hypodermic injection.

The department in initiating its campaign against the devastating hog disease has only been able to commence in a few of the districts where the cholera was the most widespread and where the active co-operation of the state was offered in enforcing the ordinary quarantine measures, etc.

The object of the department has been to endeavor to control the disease and if possible, to eliminate it from the country. To secure this end the best efforts of the farmer himself are necessary. The campaign against this devastating sickness during 1913 was planned in the territory selected along three lines.

1. The education and organization of the farmers in the district selected, to be carried out primarily by the state college.

2. The enforcement of sanitation and restrictive regulations by the state veterinarian.

3. Active supervision by the Bureau of Animal Industry of the department and the inoculation of diseased herds and exposed herds with the anti-hog-cholera serum.

A county in each state was selected as a unit and the method of work in that county was, briefly, for the state college to secure the co-operation of intelligent, active farmers in each township in the county. These men were called volunteer assistants and they were to keep in close communication with the department's inspector stationed in that area, keeping him informed of conditions and securing statistics concerning the hog industry. In this manner conditions were pretty well learned in the territory under inspection. When an outbreak of bog cholera was reported the department's inspector went to that outbreak and saved all the hogs he could by treatment with serum. As the disease is very easily transmitted, he then protected all herds in the immediate vicinity by inoculation. The idea was to form a zone of immune animals around the infected center.

Hog holera is caused by a germ that exists in the blood. It is an organism apparently so small that the most powerful microscopes do not show it. However, it is easy to demonstrate its presence by inoculating a small part of the blood from a sick hog into a well one, which produces the hog cholera.

Hog cholera is a disease which seems to be stopped to a degree by the frosts of winter, although frost cannot be said to stop a case after it has taken hold of its victim. However, it seems to prevent the rapid spread of the disease. The result is that in spring time the affection is as a rule at the lowest ebb but increases rapidly from that time until fall.

Hog cholera does not seem to affect any particular breed of hogs more than another, and while generally the careless farmer is more apt to have the disease among his hogs than the careful one, the disease sometimes occurs where the conditions are sanitary. It is hoped that the work may be extended gradually until the disease is completely controlled or eliminated. The fact that hog cholera is carried not only by the hogs themselves, but by birds, dogs, streams and even on the feet of men going from one farm to another shows how necessary it is that the campaign be thorough and that farmers exert their best efforts to assist in the work.

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BUY THE HERD LEADER EARLY.

Those who desire a sire for their herd of swine should procure him at the earliest possible date. The reasons why the boar should be purchased early are, first, there is always pick and choice even in the best bred herds. No breeder has yet been able to grow 100 pigs and have them all alike. The sooner, therefore, the purchase of the boar is made the greater the room for choice. No one likes to purchase the leavings of any herd. Second, many sires purchased carry so much flesh that they are useless for breeding purposes for some time and need to be put in condition for service. Third, no pig should be allowed to mingle with the herd until he has been three weeks in quarantine. By this I mean a place where he can be kept separate from the herd. While the danger from cholera is not very great and though no reputable breeder will sell an animal after cholera has appeared in his herd except subject to non-payment in case the disease develops within a certain period, there is always more or less danger. The herd from which he comes may have been infected though no sickness had yet appeared or the disease may have been contracted during shipment.

The above reasons more than outweigh any reason that can be advanced in favor of delay in the purchase of the boar. The time should be taken to carefully examine the pedigree of the animal which is to be purchased. There is more danger of inbreeding or too close breeding in hogs than in any other class of animals on the farm. Breeders all desire if possible to get prize winning stock. In fact I sometimes think that many are a little over enthusiastic on this line. If some particular family has taken the lead at the state fair during one season the prominent breeders all intend to secure stock of that family. Hence if one has bought from a breeder last year he may this year secure the same blood from a breeder several hundred miles away. Before purchasing a valuable animal it is well to ask for an extended pedigree and see how often the blood lines run back to to the same animal within a comparatively few crosses It is really a difficult matter some times to secure a boar that is not bred so closely to the sows that evil results may follow in the progeny.

It is not necessary to say that in buying one should confine himself to his own breed except where he has no intention of using the progeny as breeding stock. He should stick to his own breed and avoid crossing except for the special purpose of using the same sires and dams from year to year and selling the progeny for pork purposes exclusively. I am quite well aware that some excellent results are obtained by crossing but I believe that these results are due mainly to the fact that in crossing one avoids inbreeding too closely or too close breeding. I may be wrong about this but the very fact that blood not closely related is brought into a herd is in itself sufficient to account for one superiority that is often found in these cross bred animals. It is of course folly to undertake to use cross bred animals for breeding purposes. The inevitable result will be an utter lack of uniformity and a harking back not to the good points of either side but to the scrub characteristics that are latent in all breeds.—John Underwood, Illinois.

SOUTHERN BOYS TAUGHT TO BREED GOOD HOGS.

The Department of Agriculture is endeavoring to interest the younger generation on southern farms in the breeding of good hogs. It is the object of the department to encourage the young men to raise at least enough pork for home consumption, and if possible, a surplus for the market. Pork can be marketed in many forms—fresh pork, hams, bacon and sausage—and can be produced so as to sell much cheaper than beef. A shortage of beef means an increased demand for pork, and it seems reasonable that there should be a ready demand for all the available supply. This means money in the pocket of the boy hog raiser.

Some of the points which the department advises the youthful hog grower to bear in mind are the following:

1. The feeding and care are as important as the breeding in producing a good hog. Plenty of feed and good care may make a good hog out of a runt, but lack of it will always make a runt out of a good pig.

2. To make pork cheaply a permanent pasture and forage crops must be used.

3. Young pigs must have a dry bed and plenty of sunshine.

4. Begin feeding the pig as soon as he will eat, and keep him growing until he is mature.

5. Always keep plenty of clean, fresh water where the hogs may drink at any time.

6. Quarantine all newly purchased animals for three weeks.

7. Never keep a female for a brood sow, no matter how well bred she may be, if she will not produce more than four strong pigs at a litter.

8. The more milk a sow will give the faster her pigs will grow.

9. Lice prevent a hog from doing well.

10. Always keep a mixture of charcoal, wood ashes, lime, sulphur, salt, and copperas before the hogs.

These points are emphasized in a bulletin just issued by the Bureau of Animal Industry, entitled "Boys' Pig Clubs, with special reference to their organization in the South." It can be had free by the young farmer by application to the department. It contains a number of illustrations, a design of a portable hog house, which can be built easily and cheaply, and a design of feeding pens for small pigs.

The capacity of the farm may be increased by building up the silo so as to make each acre yield more.

The West Central Minnesota Development Association, comprising 17 counties in the west central portion of the state, all of which have county agents, has recently purchased five carloads of registered alfalfa seed for distribution in these counties Total cost of the seed is $30,000 and will furnish about 100 bushels for each county.

The Shepherd

BREEDING EWES IN FALL.

The late summer and fall is a very trying time for the breeding ewes, and unless the owner maintains the flock in a vigorous condition, the profits are likely to be cut down to a great extent. It is good to have an abundance of green pasture and forage crops for the ewes to maintain and regain the strength and flesh which they have lost during the sucking of their lambs. They should be put to this as soon as they have weaned their lambs and should be treated well just after weaning, so they will regain their normal condition by mating time.

FEEDING RACKS.

Combination racks which may be closed to keep the sheep away from the feed, whether hay or grain, are satisfactory for a breeding flock. One of the simplest forms is a tight-bottomed rack about two feet wide. Cross-pieces and side-posts of 2x4s should be used to insure maximum strength and upright boards about eight inches wide placed on the inside to form the grain trough in the bottom.

Another board of about the same width, to retain the hay, about a foot above the first, is generally used, and it is better to cut the tops of the upright 2x4s on an angle in order to make the rack a little flaring at the top as a convenience in putting in the hay.

Then another board should be arranged in a slot made for the purpose in such a manner that, by the use of a lever and a small rope attached to the board in the middle and running over a pully, it may be used to raise or lower this board in such a manner as to permit the sheep to put their heads in the rack or not, as desired.

SILAGE FOR EWES.

Silage containing much corn must be fed to pregnant ewes with precaution, as it is not only a highly nutritious feed, but tends to keep the digestive tract too loose. Then, ensilage containing a high percentage of corn is too fattening for pregnant ewes. Too much fat-forming food during this period tends to weaken the foetus and to cause increased difficulty at lambing time.

REMOVING BURRS.

Burrs, burdocks and thistles are easily removed from the wool if it is done shortly after they become attached to the fleece, but if they are left in it for a while, it is impossible to remove them without wasting considerable wool and giving the animals more or less pain.

SOME KIND OF SHEEP.

Aunt Mirandy put her head in at the shop door and accosted the plumber: "Here, you; when can you come up and put a buck in my spring "

"A buck in your spring?"

"Yes; my spring's down to the foot of the hill, and they tell me to put a buck in it to fetch the water to the house."

"Oh! You mean a hydraulic ram?"

"Aw, maybe so. No matter. I knew it was some kind of a sheep."

TIME TO FATTEN.

If sheep are in a good, thrifty condition at the start, two months of good feeding will properly fatten for market.

California led last year in timber sold from national forests, though Montana had the largest number of sale transactions.

The biological survey and the forest service have been co-operating in the extermination of ground squirrels on national forests in California. The annual loss of range feed and grain crops from ground squirrels is enormous.

XUM

COLMAN'S RURAL WORLD

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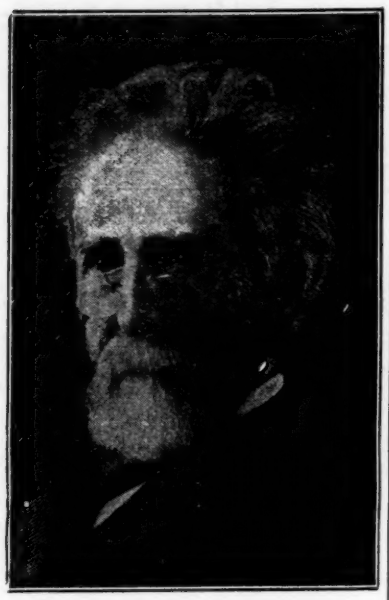

Norman J. Colman,
First U. S. Secretary of Agriculture.

COLMAN'S RURAL WORLD was established in 1848 by Norman J. Colman, who later became the first United States Secretary of Agriculture. As a clarion of advanced agriculture this journal has attracted nation-wide support, and is to-day held in highest regard by thousands of intelligent and discriminating readers.

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A doctor at the Battle Creek conference sums up the situation by saying that the race is not deteriorating but that the country is in a "state of intelligent discontent" with present health conditions. The next thing should be to put more stress upon intelligence than upon discontent.

The acquittal of the German officers concerned in the Zabern case is a triumph for militarism, but it may prove a costly triumph. Few things have done so much to breed hatred in Alsace-Lorraine as this display of military arrogance and tyranny; Germany at large is far from approving, and feeling in France has been intense.

The National Corn Exposition coming to Texas in February, offers an unprecedented opportunity for a grand state movement for the betterment of agriculture. The dozens of educational features presented by the various state agricultural colleges in their booths in Agricultural Hall at the Fair Grounds will offer suggestions for the farmers whereby better crops can be produced.

Plans for a vigorous nation-wide campaign to secure a constitutional amendment giving suffrage to women were outlined at Washington by the congressional union for woman suffrange. The program includes a schedule of "demonstrations" that will, according to the suffrage leaders, "awaken the country as never before to a realization of the issue and if necessary transfer the majority in Congress to a party that will stand for suffrage."

President Wilson's appeal to men of affairs is receiving the heed which it merits. Men of leadership in business are understanding the situation and responding to it. We are getting in line for a revival of legitimate business. Bankers are acknowledging that the new currency law is valuable and workable and are hastening to get in line and co-operate. At last the United States has a flexible banking system comparable with the systems of other countries.

It is worth taking note of that the savings banks in New York city report that their deposits for the first 10 days of January were $4,000,000 greater than for the same period last year. The first 10 days of 1913 saw withdrawals of nearly $1,000,000 in excess of the deposits. The New York Herald points out that these deposits, constituting a new record of growth, are the wages of the workers, and is moved to ask, "When has there been greater or more real prosperity?"

BOYS' AND GIRLS' CLUB WORK.

The Boys' and Girls' Club Champions, from the several states of the North and West, were entertained in Washington during the December conference week by members of the office. Fifteen states were represented among the champions. Nearly twenty persons, prominent in social and educational work, paid their own expenses to attend this conference and to become familiar with the National Club work. They came from all parts of the United States from Massachusetts to Alabama and Utah. One of these, Mr. Gerrard Harris, journalist and author, from Mobile, Ala., delivered an address and presented to each club champion the book of which he is the author, entitled "Joe the Book Farmer." This was especially appreciated by the club champions, as it is the first story written as fiction, based entirely upon the work of a corn club boy and has influence upon parents, school chums, servants, neighbors and state. Books of this kind are especially valuable for club and school libraries and as prizes.

PHYSICIANS OF GERMANY IN 1913.

Acording to Prof. Schwalbe's Directory for Germany for 1914, the number of physicians in Germany in 1913 was 34,136. Compared with the population, 66,835,000, this gives 5.11 physicians per 10,000 inhabitants. About 100 physicians must be subtracted who practice at the health resorts in summer and other cities in winter and therefore are reckoned twice. The number of physicians in Germany has increased since 1901 from a proportion of 9.92 to 5.11 per 10,000 inhabitants. In addition, there are 168 ship surgeons and 163 physicians in the German colonies. About 500 physicians are lost to Germany annually through death and emigration. The number of licenses and the number of medical students is continually increasing. In 1916, 2,000 young physicians may be expected to enter the profession. The physicians are unusually numerous in the large cities, the proportion being 9.6 per 10,000 inhabitants in the large cities with a total of about 15,000,000 inhabitants as compared with 3.8 per 10,000 inhabitants in the rest of Germany with a total population of over 51,000,000. It is estimated that there are in greater Berlin 11.09 physicians per 10,000 inhabitants. Wiesbaden has 28 physicians per 10,000 inhabitants, while the town of Hamborn has only 2.3. The number of women practitioners is steadily increasing, there being 151 in 1912 and 195 in 1913. They prefer to settle in the large cities. A similar increase is observed in the number of specialists.

RANGE CAN BE RESTORED WITHOUT CLOSING IT.

That a serious decline in the carrying capacity of vast areas of western grazing lands, due largely to the fact that stockmen fail to give the range plants a chance to keep growing, can be remedied without closing these areas to cattle and sheep, is the statement made by the Department of Agriculture in a bulletin recently issued on range improvement. Excessive grazing in the spring before the forage crop is mature, and such grazing continued year after year, says the department, are the main causes of range deterioration.

On the national forests, the department points out, where the government is doing away with these evils and stock is handled under government regulation, the range lands have improved to a point where it is again possible to market large numbers of beef and mutton animals directly from the range.

In the "free for all" period of early days, the department goes on to say, the most palatable forage plants were so closely cropped that they were unable to develop the necessary plant food, and so literally starved. In addition, the roots were frequently injured by trampling or killed by exposure. As a result the best kinds of vegetation grew weaker from season to season, and where the practice of early and close grazing was continued, the range at last became practically denuded.

The vegetation which furnishes the grazing crop has much the same growth requirements as a farm crop. No farmer who hopes to realize the best returns from a permanent hay meadow, it is stated, would think of harvesting the crop as son as it is tall enough to cut, regardless of whether or not it is mature. Nor would he graze a permanent pasture closely from the time the growth begins until it ceases, for he knows that this will result finally in killing it out. And since climate and soil conditions over much of the western grazing lands are less favorable to plant growth than those on the average farm, even greater care must be exercised in utilizing the range crop than is necessary with that on the farm.

The remedy suggested for range deterioration is a system of deferred grazing. Under such a plan an overgrazed portion of the range, sufficiently large to supply the forage from the time of seed maturity until the end of the grazing season, is protected from stock until the seed crop has matured. Upon maturity of the seed crop the forage is grazed during the first season, but not to the extent of injuring seed plants. The same area is protected in the same way during the second and, if necessary, subsequent seasons, or until the new plants have been securely established. When the area has been thoroughly reseeded it can be again grazed early in the season, and a second area, large enough to accommodate the stock from the time of seed ripening to the end of the season, is protected until the forage is mature.

By this method of alternating late grazing from one area to another, weakened vegetation can recover its vitality without the need of having the land closed to grazing the entire year.

A MEDICAL OPINION ON UP-TO-DATE DANCES.

The latter-day dances have been discussed and criticized from almost every standpoint. To complete the list, the Journal of the American Medical Association has recently raised its dignified and professional editorial voice in gentle warning. "It seems somewhat late," it says, "to enter a mild protest against the fervor with which the newest so-called dances have been taken up by a public already saturated with various nerve and mind-destroying amusements and caprices. It seems unnecessary to call attention to the fact that the tango, the various waltzes, the maxixe, etc., are being arduously cultivated by callow youth and calloused old age. The problems created by these dances differ according to the age of the participants; for the young the question of morality is paramount; for the old the possibility of too great a strain on a dilated heart or an arteriosclerotic vessel is apparent. The physician will do well to caution the stiff-jointed, aged patient, who derives too great a pleasure from those—to him—potentially harmful amusements."

COST AND LOCATION OF EARTH ROADS.

The cost of hauling over country roads is largely determined by the size of the load that can be hauled, the number of trips that can be made in a day and the wear and tear on teams and equipment, according to the office of public roads, Department of Agriculture. Steep grades as well as ruts and mud-holes serve to decrease both the speed and the load. On the principle that a chain is no stronger than its weakest link, the maximum load that a team can draw is the load it can draw up the steepest hill or through the deepest mud-hole on that road.

Wherever possible roads should be located on straight lines between terminal points. In hilly or mountainous country, however, the attempts to keep roads straight between terminals often leads to the serious error of heavy grades. Straightness and grade must therefore be handled together. The best location is one which is straight in general direction, is free from steep grades, is located on solid ground and serves the largest possible number of people. Roads should be located for the benefit of the public as well as the private land owner.

The elimination of one or two steep hills on a line of road will frequently enable horses to draw three or four times as much as they could draw on the old road. It takes approximately four times as much power to draw loads up 10 per cent grades (10 feet vertical in 100 feet horizontal) as on a level, but on a 4 per cent or 5 per cent grade a horse can usually draw (for a short time) as much as he can draw on a level. A 4 per cent grade is therefore considered the maximum on roads subject to heavy hauling. Many steep grades may be avoided by locating the road around instead of over the hill—the handle of the bucket is no longer when held in a horizontal position than in a vertical. By going around we avoid two steep hills.

If the road must pass up a steep hill or mountain sides, the steepness of the grade may be decreased by increasing the length of the road. In other words, eliminate steep grades by locating the road on curved or zigzag lines, and not in a straight line from the bottom to the top of the hill. These curves should be carefully plotted and the straight sketche located with an instrument. This improves the looks of the road and does not add materially to its cost.

In studying the relation of grade to distance the following calculation is interesting: To lift a ton one foot high requires 2,000 foot pounds of energy; on a road the surface of which offers 100 pounds of tractive resistance per ton the same energy would roll the ton a horizontal distance of 20 feet. To save one foot of grade the road may therefore be lengthened 20 feet.

Roads should never be located so close to stream beds as to be subject to overflow, or on ground which is constantly damp and marshy.

The earth road should have at least six hours of sunshine each day. This can be secured by locating the road with southern or western exposure, or by having such brush and trees as impede the drying action of the sun and wind removed. With gravel and stone roads this is not so necessary, as a certain amount of moisture is needed on such roads, especially in the summer time.

Relocating roads is not an engineering problem alone. One must also consider the effect of the road on those who now live upon it. Many farmers dislike to have the road placed back of their house or out of sight of it. It requires tact and good judgment to secure a suitable location without arousing harsh antagonism.

XUM

HOW TO GROW ALFALFA.

By C. D. Lyon.

When I spoke to the farmers of Richland county, Ill., February 14th, 1913, at Olney, I promised them to write out the lecture I gave upon the subject of alfalfa, that it might be published in the local papers of the county, and this is written in fulfillment of that promise, as being, not only my experience as a successful alfalfa grower upon my own farm, but the result of my observations of alfalfa in at least ten states.

The neighbors said that I could not grow it, and some half dozen or more successive failures made it look like they might be right, but at last I succeeded, and since my first success, ten years ago, I have no more trouble in getting a stand of alfalfa than a stand of wheat, and hundreds of others have done the same by my directions.

There are several requirements which must be met in order to get a stand of alfalfa, and if the prospective grower meets all of these but one, and fails in this one, he might as well have never undertaken the job.

These requirements may be stated as, drainage, lime, fertility, soil preparation, inoculation, heavy seeding, and if it is desired to maintain the stand for a number of years, cultivation, all of which will be mentioned in their proper term.

Drainage.

The soil must be one upon which water never stands, and in which complete saturation of the subsoil never stands nearer than two and a half feet from the surface for any length of time during the growing season.

Of course many of our best alfalfa soils do become full of water during periods of heavy rain fall, but this water must have prompt means of escape or the life of the alfalfa will be short.

This point, then, must be observed, on land where water stands, or where it is held for considerable time in the subsoil at less than three feet, thorough drainage must be the rule before seeding the crop.

On most farms there are rolling lands, perfectly adapted to alfalfa growing, and these should be chosen for the crop, unless there are special reasons for preferring lands where drainage is necessary in order to attain success.

We find on our rolling lands, that a gentle slope to the east or the south, is to be preferred to those sloping west or north, but have seen excellent crops grown on all exposures.

Lime.

Alfalfa is no more tolerant of an acid soil than it is of one full of water, and in addition to this, it uses more lime in its growth than most other crops do, so it is necessary that the soil be not only "sweet" but plentifully supplied with lime.

In order to test soils for acidity, get a few strips of blue litmus paper of your druggist, and do not touch it with your bare hands any more than you can help. Go into your field when the soil is very wet, and with a clean knife, or strip of wood, dig up soil enough to make a round ball about the size of an egg. Cut a slit in this ball, insert the strip of litmus paper. lay it in a clean pail or basket, and repeat the operation in four or five different parts of the field.

In about half an hour look at the strips of paper, and if the blue color has changed to deep pink or red, your soil is acid and will need liming.

As to the amount of either burned lime or ground limestone necessary to be used, the best growers differ. In all probability, 1000 pounds of air slaked lime, or 2,000 pounds of finely ground limestone per acre, will be enough to correct acid conditions in most soils, but, in the case of the ground stone, even double this amount may safely be used on any soil.

Fertility.

While alfalfa will make fair yields upon soil that will not produce heavy crops of corn, wheat or oats, it will also produce its heaviest crops upon very rich soil, and, as a maximum crop of alfalfa hay is worth perhaps twice as much as the crop of corn that would have grown upon the same acreage, it is desirable to sow it only upon soil that is strong in fertility. There is another reason which will be treated of later, and this is found in the fact that the sooner you get strong healthy alfalfa plants, the less the danger of blue grass in the crop.

In your country, as in mine, blue grass is the greatest enemy of alfalfa and every field of it, sooner or later, must give way to blue grass and be broken up and planted to other crops for a term of years.

Bearing this fact in mind, we should not sow alfalfa on land recently broken out of blue grass soil, and we prefer to make our seeding upon land that has had at least two cultivated crops corn or potatoes, grown since the soil was broken.

The application of stable or barn yard manure should not be made directly before seeding the alfalfa, but upon the crop preceding it, for example, if the land was in corn in 1912, manure it heavily in March, disk the manure in well and sow to oats, or plant to early potatoes, as preparatory to seeding in August, 1913. It is not perfectly safe to use manure made from red top or timothy hay, as by so doing it is possible to introduce considerable grass seed which may not germinate during the cultivating season and may come up after the alfalfa seed is sown, so it is best to use manure made from corn fodder if possible.

In addition to the manure and the time used, I strongly recommend the use of commercial fertilizers upon the alfalfa land just before seeding, and the rate at which this may be used depends upon the ability of the man who is seeding to buy it, together with his idea of what constitutes a liberal application.

Four hundred pounds per acre and upward, of dissolved bone with the addition of 30 to 40 pounds per 100 pounds of muriate of potash, added to the bone, and shoveled together before applying will always pay.

Soil Preparation.

Now we come to the point where we must lay down iron clad rules and the man who does not expect to follow them to the letter, had best stop reading right here. I have seen fair success attained by seeding on fresh broken and half prepared land, with seed sown in wheat in April and even with seed sown at the last cultivation of corn in July, but for every such success, I have seen and heard of 100 failures, so I propose to give you nothing but the plans that I, and hundreds of others have tested, and found to be successful nine years out of ten.

We are taking it for granted, that the reader has a plot of land that is well drained and has had a liberal application of both lime and manure, either the fall of 1912 or the early spring of 1913.

I prefer that the land was in corn last year, and that the crop has been well cultivated, no grass or weed seeds allowed to mature and well manured during winter, and if it has been well manured, I would not care whether it was sown to wheat last fall, or oats this spring, or if it is to be planted to early potatoes in early April.

In the case of either wheat or oats, I would adopt one of two plans. First I would follow the binder with disk harrow, or I would—second—remove the grain crop as soon as possible after cutting, mow the stubble, burn it as soon as dry enough, and then thoroughly disk the land as deep as possible.

In my most successful seedings of alfalfa, as well as in those which have come under my observation, the disk harrow, and not the breaking plow, has been used to prepare the soil for the crop.

Where the plow is used, and at any considerable depth, it is impossible to thoroughly work up the soil down to the furrow bottom, some air spaces will remain and in winter these will fill with water which will expand in freezing and cause some of the plants to die, but if the disk harrow is used to make the seed bed, it will all be of the same degree of fineness and compactness.

I have disked as many as six times, at intervals of from three days to a week, following the disk harrow, each time, with spike tooth harrow, plank drag roller, or whatever implement for pulverizing and compacting the soil its condition seemed to demand.

The idea must be, to get the soil, to a depth of six or seven inches, broken up, thoroughly mixed, pulverized, and at the same time compacted, so that at the final work the horses' hoofs will not sink into it more than at most an inch and a half.

The most expert wheat grower in your neighborhood, the man who put in the most time preparing his wheat land and grew the largest crop per acre, is the man to follow in preparing your alfalfa seed bed, but remember, that you had best give your alfalfa land two more workings at the point he left off.

Time of Seeding.

From the first day of August until the first day of September.

If I had my land in first class condition a few days earlier and a good shower came, I might be tempted to sow, yet I have never sown earlier than August 10, and if I failed to get a good shower or two during August, I might sow as late as September 5, but if I could choose my exact date of seeding it would be as near August 20 as possible.

Amount of Seed.

While I have seen good stands result from sowing 12 pounds per acre, and have known as much as 30 pounds per acre to be sown, I believe that the concensus of opinion among the best alfalfa men east of the Mississippi river is, that 20 pounds of good seed per acre usually results in the best stands, not too thick, yet thick enough to thoroughly occupy the land.

I have never asked where my seed came from and have never had any trouble from winter killing the first winter, yet I find strong prejudice against Southern Oklahoma, or seed grown under irrigation, and as it is not difficult to get Northern Kansas or Nebraska seed, I would stipulate with my dealer that the seed bought must come from this section.

No matter how clean the seed may be, it is an excellent plan to screen it with a fine seed meal sieve before sowing as this will take out a few small shrunken seeds, and as alfalfa seed is sometimes carelessly put in sacks which have held grass seeds, it will remove any of these.

Inoculation of Soil.

The average farmer is getting to understand this important matter better than he formerly did, and it is not necessary to say any more about it than to record the fact, that there are certain organisms necessary to the health and growth of the plant and if these are not present in the soil, failure to get a stand will result, no matter how carefully you have observed all the other rules necessary to get a stand of alfalfa. If you have been trying to grow alfalfa and have failed, your failure has probably come from the fact that these organisms were not in your soil, so you must supply them or fail again.

If sweet clover grows near you, a day or two before you expect to sow your alfalfa, go to a sweet clover patch, and with shovel, or even a big spoon, collect from the top two inches of soil among the plants, 125 to 150 pounds of soil for every acre of alfalfa you expect to sow.

Perhaps sweet clover does not grow near you and in this event send to your Experiment Station and have them send you inoculated soil from their alfalfa or sweet clover plats as this will cost you about 50 cents per hundred pounds with added freight.

Keep this soil in the bags and the dark until you are ready to sow, light damages it, and sow it over your field just ahead of the harrow as you are giving your soil the final preparation.

If you are using commercial fertilizer this is also the time to apply it that it may be mixed with the soil.

Seeding.

I prefer to sow just after the rain and as son after as the soil is in good condition to be worked.

Have the top soil as fine and mellow as possible, using harrow and light plank drag, leaving the land as level and free from deep harrow marks as you can before seeding.

I sow by hand, the old fashioned way, as I think that I can distribute the seed more evenly that way, but a wheelbarrow seeder does the work very well.

If you sow half the seed east and west and half north and south, you will get a much more uniform stand and a uniform stand means that you will have less weeds and grass in your crop. Cover the seed by going over the land with a light harrow, the lighter the better, with teeth set trailing backward, and to avoid trampling the land any more than possible, it is well to use but one horse for this purpose and let a boy ride the horse.

Cultivation.

Alfalfa sown in August will make from six to twenty inches growth, ten or twelve inches being perhaps a fair average, before frost stops its growth in October.

It has been found a good plan to run a light harrow over the young alfalfa in early October, but this is not advisable unless the plants have made a maximum growth. No matter how large the alfalfa sown in August gets before the growing season is over, never, under any circumstances, clip or mow them down, as you need all the full growth you can get as winter protection to the young plants.

You will cut your first alfalfa crop sometime during the last days of May or a little over nine months from the day it is sown, and on at least two occasions I got fully two tons of well cured hay per acre from this first cutting. Now I am going to write about how to keep a stand of alfalfa after you have secured it.

The old plan was to let it go until about the second year, or until grass had begun to make quite a good showing, then to go in with disc harrow and give the whole crop a good shaking up.

This got rid of some grass, but it also cut and scarred up the alfalfa roots below the crowns, and it was found that in a year or two these damaged roots resulted in the death of the plants.

We found that the common 60 to 72 tooth spike harrow is the best implement to cultivate alfalfa with and we use it after cutting each and every crop of alfalfa hay from first to last.

Weight it down if necessary to make it scratch the soil and uproot any grass which may have started, and after you have gone over the land one way, cross it.

You may knock off a few buds but the rest will make up for that and you will not damage the tough alfalfa roots, but you will destroy lots of young blue grass and it is blue grass that is alfalfa's worst enemy.

Cutting.

Alfalfa tells you when it ought to be cut. Look at the crowns near the surface of the ground, just about the time the first blossoms appear.

If you find the buds which are to make the next crop started, or from ⅛ to ¼ inch long, go ahead and cut. Sometimes the buds do not start until the plants are half in bloom, but usually when we begin to see blooms here and there we can find the buds and then the sooner the crop is cut, cured and put into the barn the better it will be for the next crop.

The second crop will be ready to cut in 28 to 35 days after the first one, and the third crop about the same time after the second. I have cut fourth crops, but have never done so without damaging future crops, as plants need full growth for protection.

Curing the Hay.

I find alfalfa no harder to cure than common red clover is, so I give no directions for either curing the hay or the caring for it, other than to say that it does not keep in stack any better than clover does, and if it is stacked out should be covered with grass hay of some sort.

Conclusion.

I have seen fields of alfalfa fourteen years old, still producing fairly well, that had given three crops of hay per year during all this time, but the average profitable term of an alfalfa stand is probably six years. The fact is, I do not consider it desirable to keep land in alfalfa more than five years, as by that time the land in which it grows has become so rich that it will pay to break it for other crops, having a new field of alfalfa ready.

XUM

Home Circle

THE FARMER'S CHALLENGE.

By L. H. Bailey.

Blow ye winds and lay on ye storms
And come ye pests in rabble swarms
And fall ye blights in legion forms—
I am here: I surrender not
Nor yield my place one piece or jot;—

For these are my lands
And these are my hands
I am bone of the folk that resistlessly stands.

The blood of old ploughmen runs hard in my arm
Of axmen and yeomen and battlemen all
Who fought and who flinched not by marish and wall
Who met the bold day and chased ev'ry alarm;
My father-kind sleep, but I hear the old call
And fight the hot battle by forge and by farm;—

For these are my lands
And these are my hands
I am bone of the folk that resistlessly stands. —Rural Manhood.

INTERESTING LETTER FROM VALLEY PARK.

By Sallie.

This "aFrmer's Challenge" is something quite fine, and isn't it true?

The farmer (if anybody) can say, "Blow ye winds and lay on ye storms—I am here, I surrender not—For these are my lands and these are my hands."

The winds are blowing this January day, but the sun is shining. We have a cousin who used to clerk in a grocery store, and he used to say the farmer customers did more complaining than any others. I don't quite agree with him, but we do complain more than we ought. Suppose a body had to pay so much every month for rent, and so much for every thing they eat, think of having to pay forty-five cents for a dozen of eggs; to pay for every glass of jelly or can of fruit (I don't know how it would seem to buy jelly; we wouldn't sail into it the way we do for one thing.) Five years ago I bought a can of peaches for twenty-five cents. They were nice looking but with no taste, and that can lasted us till peaches came again in season. Just this morning I made some blackberry jelly. Last summer we sweated and sweltered in the hot sun, got scratched, and clothes torn, picking them (they are wild), made some jelly, but canned the rest. Jelly making in summer is warm work, especially if you've been out all morning gathering them. But the jelly is much finer and prettier if made on a hot summer day, I think. We are poor folks and often I wonder what we would do if we didn't have a dear old run-down farm. The run-down part has come about through its being rented out ever since father's death, and the creek washing and cutting so, without the wherewithal to fix things. To be honest Nettie B. Richmond, that was the reason of my Christmas letter. Christmas a year ago friends and neighbors bothered us so for Christmas trees, and a person does hate to refuse such favors at such a time, but there is also another side. A person hates to see a nice tree that lends beauty to the place whacked down. It is a shelter for the birds. If it was really necessary; if the children had no other pleasures or had never seen anything of the kind, but they are sometimes made cross because there are so many things to distract them. Of course I know there are still many poor little ones in every place; and to give such as these pleasure would be the thing to do. A child is more value than all the trees, but there are many children, and still more grownups that might be taught to love trees or any growing plant more than they do. Just last week two men wanted to cut down a big walnut tree, and when we told them no (they were buying walnut logs) one said would you rather have it blown down by storms? Of course we don't want that either, but we have to run that risk. I always remember "O woodman spare that tree—in youth it sheltered me and I'll protect it now," and that father loved these trees.

My little deaf and dumb niece has been standing near me, watching me write. Just as I used to stand beside father and watch him. I remember asking him once what letter that was that was always falling over. He wrote sprawling hand and his Bs were about to fall down. This little girl is smarter, prettier and healthier than I was at her age, but she cannot hear or talk, and her mother (my sister) is afraid to send her to school. She is outdoors in all kinds of weather, with her two dogs.

Our youngest brother is deaf and dumb. We sent him to school but the professor said he could not learn. He loves to go to church and Sunday school. I tried to learn him to make garden, but he would always dig trenches. He gets wood and is a great help in the house. Somethings he seemed unable to learn. The little girl seems able to learn anything and has signs for everything. The dogs and cats understand her way of calling them. She has a white rabbit and some pigeons.

She was mad Christmas time because her mother sold four geese, and because no one gave her a red handkerchief like our brother's. She had plenty of other presents, a tree, a big doll and little trinkets. She always wants something she doesn't get and likes some one else gets, no matter how cheap and common it happens to be.

LOOKING INTO COUNTRY CONDITIONS.

By Early Alice.

Yesterday's daily paper contained a cartoon that caused me to put my thinking cap on. It was this: The state superintendent of schools was looking at thousands of foot-prints in the sand—all going one way. There were two signboards pointing the way. One read "To the Farm," the other, "To the City." And which way, dear farmer friend, do you suppose this school superintendent saw our boys and girls are traveling? Towards the city, of course.

Among the boys we know there isn't one being trained for farm work. One neighbor boy did go to A. and M. college and came back a wicked brute. There is now a question in my mind as to the wisdom of sending a boy raised in a refined Christian home to such a place as our agricultural college has been in the past. I questioned this boy as to poultry raising at college station; he said "there isn't a chicken on the campus." Teaching boys to be farmers and all the poultry lore from books. He said they taught him there were different kinds of houses needed, yet he didn't know what a brooder-house was built for.

There is a reason for all the toes being pointed towards the city. Young people like nice clothes and amusement. When farmers wake up to the fact that son's time is worth as much as a hired man's, and pay the boy accordingly, it will bring about greater content. Another thing, the long hours on the farm are killing the ambition of young men to become farmers. If we could obtain better farm machinery that would enable us to cultivate more land with greater ease it would not be so necessary to rise before dawn and retire at ten.

Every farm paper, most news papers and magazines are urging farmers to stay on the farm. Those who are succeeding will stay but the failures and the school boys look towards the city as a haven of rest.

A farm, rightly managed, means more freedom and pleasure than may be found in city life.

A young man was lamenting his not getting ahead any faster farming, i. e., he was not banking much money. On Dec. 31, 1912, he checked up his accounts and found he sold $1,000 worth of farm products last year from a small farm that is badly washed. He could not earn $40 a month in the city, as ill health keeps him from work often for a week at a time; yet when he can't work the Duroc Jersey pigs are putting on $s and the mule colts are growing in value. The Jersey calf becomes a better price; and so it goes on, not to say anything of chickens and eggs.

If our boys would figure a little before going to work in stores, mills and shops they would realize there is a bare living in such work if one could count on no loss of time.

Let us catch our children rudely by the shoulders, turn them around and point to a farm life of more freedom, better clothes and a social life in the community that will give clean, pure enjoyment.

WHEN CHINAWARE BREAKS.

It may not be generally known that white paint will mend breaks in china plates, etc., better than almost any sort of glue. First, of course the article to be repaired must be carefully washed and dried, that no particles of dirt remain. The edges are brushed with a paint that can be had at any paint shop properly prepared, placed together carefully, a string on several elastic bands passed around to keep the two or more pieces in place and several days allowed for drying.

If there are more than two pieces it is best to do one at a time; put these together firmly, set aside and when entirely dry add any others and so until the mending is complete. Use a small fine brush that will not leave smears about the outside, if any are left, wipe while still fresh, as the use of turpentine to remove them would mean a loosening of the break itself. As a rule I do not advocate trying to mend broken dishes; they usually come to pieces at a most inconvenient time, but should an especially desirable saucer or dish or plate be accidentally broken, unless it be splintered, it will be found that white paint will make it almost as good as new. It stands hot water and use far better than any of the glues sold for the purpose.

Bad Blood

Is a poisonous and dangerous thing. It affects every organ and function and brings about that low condition that predisposes to most diseases and ailments. HOOD'S SARSAPARILLA corrects it, and makes pure blood.

PATTERNS FOR RURAL WORLD READERS.

In ordering patterns for Waist, give bust measure only; for Skirts, give waist measure only; for children give age only; while for patterns for Aprons say, large, small or medium.

9842. Girl's Dress.

Cut in five sizes: 8, 10, 12, 14 and 16 years. It requires 3½ yards of 40-inch material for a 12-year size. Price 10c.

9835. Girl's Dress.

Cut in four sizes: 4, 6, 8, and 10 years. It requires 3½ yards of 40-inch material for a 6-year size. Price 10c.

9407. Girl's Apron.

Cut in five sizes: 2, 4, 6, 8 and 10 years. It requires 3⅛ yards of 27-inch material for a 6-year size. Price 10c.

9821. Ladies' One-Piece Corset Cover.

Cut in six sizes: 32, 34, 36, 38, 40 and 42 inches bust measure. It requires 1⅜ yards of 36-inch material for a medium size. Price 10c.

9825. Ladies' Skirt.

Cut in six sizes: 22, 24, 26, 28, 30 and 32 inches waist measure. It requires 6¼ yards of 32-inch material for a medium size. Price 10c.

9826. Ladies' Waist.

Cut in seven sizes: 32, 34, 36, 38, 40, 42 and 44 inches bust measure. It requires 2⅝ yards of 44-inch material for a 36-inch size. Price 10c.

9827. Ladies' House Dress.

Cut in six sizes: 32, 34, 36, 38, 40 and 42 inches bust measure. It requires 7 yards of 27-inch material for a 36-inch size. Price 10c.

9822. Ladies' Apron.

Cut in three sizes: Small, medium and large. It requires 4 yards of 36-inch material for a medium size. Price 10c.

These patterns will be sent to RURAL WORLD subscribers for 10 cents each (silver or stamps).

If you want more than one pattern, send 10 cents for each additional pattern desired.

Fill out this coupon and send it to COLMAN'S RURAL WORLD, 716 Lucas Ave., St. Louis, Mo.:

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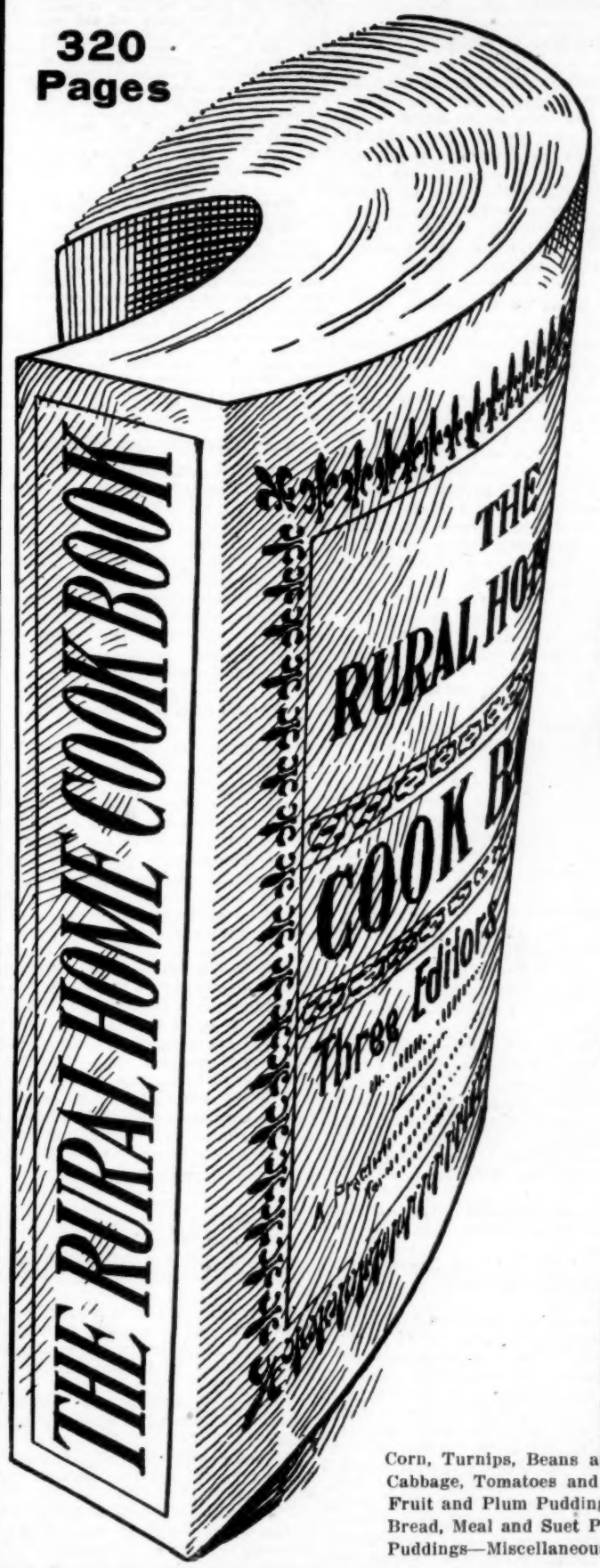

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REMEMBER

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Horseman

Thirteen weeks of racing in the Grand Circuit this year.

A fast walk and a primp telling road gait are to a great extent matters of education.

John Murphy, Plattsville, Wisconsin, recently purchased the trotter Baron Lyndhurst, 2:25¼.

Chas. Hagen of Leavenworth, Kans., has a fine young stallion in Theorist 33744, which he is driving every day the weather permits.

Frank Caton arrived in the United States from Russia recently and will remain until after the New York sale this month.

S. M. Yeager, one of Missouri's successful trainers and exhibitors of saddle and show horses, does his training at Sturgeon, Mo.

Trev Anderson, the efficient trainer and manager of the firm of Houchin & Anderson, Jefferson City, Mo., has about forty head of good prospects in training.

A movement has been started to have a number of early shows in northwestern Missouri, and all arranged into a circuit, which is a move in the right direction.

Lovers of the harness horse at Quebec, Canada, were recently entertained by a matched race for $400 a side between Frankie Bogash 2:15¼ and Henry R. 2:18¼.

C. C. Woods, the Butler, Mo., breeder and owner who is disposing of most all his horse stock, has a trotting bred stallion that with little or no handling acts like he could make a gaited saddler.

A. C. Leavel, the Harrisonville, Mo., druggist, is just a little elated over the prospects of getting a Rex McDonald colt out of his favorite brood mare, Dock Messenger, her dam by a son of King Pharo.

Trainer Jas. H. Trapp, at Platte City, Mo., has in his opinion a four-year-old stallion by a son of Chester Dare 10, that will give the boys a good run for first honors in the junior classes next season.

P. H. Wirt, who has a rare collection of fine saddle-bred youngsters on his farm, which is located near Harrisonville, Mo., has in American Royal, by Royal Cross, dam by Ewing Denmark, a very promising horse.

Jas. H. Tapp, the Platte, Mo., trainer, is riding a fine-looking gelding by the late Rex Blees, and out of a mare by Mock Mesenger, which is a trotting son of Mesenger Chief; dam by Harry Brooks, a son of King Pharo.

The world's pacing record over an ice track was broken on January 17th at Minneapolis, when Geo Gano stepped a half mile in 1:02½. The fastest previous record was made in 1912 when Marion Patch went a half mile in 1:02.

The Northern Illinois District Fair will be held at Streator. It will cover six days, beginning September 7th. The general premium list amounts to $.0,000, while the same amount is offered in purses for harness horses. An important feature of the week will be the horse show. John R. Knox is speed superintendent and secretary and Chas. F. Winninger is president.

The North Iowa District Fair Association has been organized at Waterloo with the following officers: President, Senator A. L. Ames of Traer; vice-president, J. W. Ford of Cedar Falls; secretary, G. H. Holcombe, now of Galesburg; treasurer, Ira Rodamar. It is planned to hold the first fair next fall on grounds located between Waterloo and Cedar Falls.

WINTER FEEDING.

The winter feeding problem is a greater problem to solve to one's satisfaction and profit than the summer feeding problem. From lack of exercise the maintaining of the health of horses is more difficult in winter than in summer.

Horses are more in danger of contracting diseases or maladies of one kind or another in the long terms of enforced idleness and overfeeding at a time when the ration should be cut down to correspond with the amount of exercise taken, and also by overheating with improper treatment in train and improper shelter in cold weather.

THE FROZEN BITS.

Never put a frozen bit in the horse's mouth to tear the delicate skin from the roof of the mouth or the tongue. Dip the bit in water, and the frost will soon be out. When doing this, notice the coat of ice which forms on the frozen bit. It shows how cold it is. Shake the bridle a little, and the ice will fall off. Anything is good to contribute to the well-being of your horses that are helplessly obliged to take just what you give them.

CARE OF HORSES.

Don't overload your horses.

Don't feed too much corn in hot weather.

Don't make any sudden change in the feed.

Don't keep your horses in poorly ventilated stables.

Don't feed grain to warm horses. Give them hay first.

Don't allow the harness, especially the collar, to chafe.

Don't neglect to give the harness a cleaning once in a while.

Don't expect your horses to relish their feed unless the mangers are clean.

Don't give large amounts of water at one time. Small amounts frequently are much better.

Don't give your horses patent medicine that you know nothing about, especially colic remedies.

Don't keep a horse going after it begins to show signs of exhaustion. You will save time by resting a bit.

Don't allow your horses to drink a large amount of water on coming into the stable very warm. Allow them to cool off a bit first.

Don't allow young horses to wear a set of shoes more than a month. Have them removed, the hoofs leveled, and the shoes reset if they are worth it.—H. Preston Hoskins, Assistant Veterinarian, Minnesota Station.

EVOLUTION IN TROTTING.

There is no limit to the performances of man or beast. Often has it happened that pessimists have declared that the limit has been reached, only to see it passed, and a new record made for others to strive for. Even the athletic records in which there is so much human interest, are broken and new ones created. The same is true in the realm of equine performances. The grandfathers who are interested in racing matters can tell us of a time when 2:40 was considered the limit for a trotting horse to go a mile, but interest in that figure faded long ago and no one is now surprised to hear that some good stepper has clipped another second from the record made in the previous year. The performance of the two-year-old colt, Peter Volo, at Lexington, Ky., last fall, when a mile was troted in 2:04½, the world's record up to that time being 2:06¼, is quite remarkable. At the same time and place Uhlan, the champion trotter, lowered the world's mark for a quarter-mile distance by covering it in 27 seconds. Could that speed be held for a mile the distance would be trotted in 1:48.

Breeders and trainers of trotting horses are continually working to produce one that will bring the limit down to a point still further below the two-minute mark, and it need cause no surprise to find them realizing their hopes. The horse has many uses, as a worker, a hack, a carriage horse, for the saddle, the polo ground, the ranches, and so forth, but there will always be room for the trotter and for the running racer, the hunter and the steelplechaser, for the love of sport is ingrained in all men, and there will ever be a special class to whom equine performances will be an unmixed pleasure.—Ex.

WINTER EXPOSURE.

Horses should not be left out in the wind and storm. Nor should the stable be so open as to admit wind and storm, with crevices that will allow the snow to enter and cover the horses with a thick coat. Winds have a habit of driving the snow in where the least bit of an opening is and piling it upon the inside. When stables are wanting in warmth, stable blankets should be used on the horses.

A CLEVER DIVISION.

A farmer before departing this world made his will. He had in his possession 18 horses, but before the will was proved one of the horses died which left only 17 to be divided. His oldest son was to get one-half the horses, his second son one-third, and the youngest son one-ninth. These portions were easily enough separated when there were 18 horses to divide, but how to allot 17 horses into three parts was a puzzle. They scratched long at their heads, but could find no way out of the difficutly. At last they called in the assistance of a local schoolmaster, who gave them a solution to the problem. "You have 17 horses to dispose of. Well, seeing you're friends of mine, I will give you the loan of my old mare Bess, which will make 18. To you Bob (the oldest son) I will give 9 horses, which is more than the half of 17, and to you Jim I will give 6, which is more than one-third of 17, and to you Tom I will give 2, which is fully one-ninth of 17. And now, having given you all your shares, I will take back my old mare, which is still left." And having thus settled the matter to his own satisfaction the schoolmaster mounted his mare and rode off.

TAILS AND FEEDING.

The attention of a tourist in northern France was attracted to the following notice:

PASTURE YOUR HORSES HERE.

Short tailed horses, 15 cents a day.

Long tailed horses, 20 cents a day.

Upon inquiring about the difference of price, the farmer remarked that any one ought to know that, and explained that a short-tailed horse had to chase the flies with his head, and while he did so, he could not eat; while a long-tailed one, not being thus handicapped, naturally eats a great deal more.

A CLEVER HORSE.

We have often said that there is as much difference in horses as in people. They differ in looks, in color, in spirit, in endurance, in disposition, and in intelligence. There is no denying that there are very stupid horses. Many of us know also that there are not a few so clever as to startle us with what seems an almost human faculty.

One of the best we ever owned, with an absolutely perfect disposition, could free herself from the halter with a facility that was at once astonishing and amusing. When one device for preventing this trick was apparently pondered over by her and its secret solved, we tried another.

At last we matched her shrewdness, and the first morning she was found with the halter on she seemed, to our imagination no doubt, to admit by her look in her eye, that we had been too much for her.

A story from a Massachusetts town has come to us of a horse that has learned how to turn the water on to the trough in his stall by working the faucet with his teeth. He never turned it off, and so it was taken out and a shut-off placed near the rear of the stall.

His owner avers that, standing in the stall untied, a rope behind him, he has now learned to turn around, reach out some three feet and open the new faucet. But they have their limits.

We know of one which will come from any part of the stable and back into the shafts when the carriage is headed toward the exit. Turn the carriage the other way, and she will promptly walk into the shafts with her nose over the dashboard.—F. H. R. in "Our Dumb Animals."

Horsemen Here's Your Chance!

LESS THAN HALF PRICE!

FARRIERY

The Art of Shoeing Horses

Everyone who owns a horse should have a copy of "Shoeing Horses," by R. Boylston Hall, who has been engaged in "balancing" the feet of horses for over 45 years. The author is now 74 years old and wishes to dispose of some 800 books at a price which will enable horse owners to buy without hesitation. The author wants to do some good in the way of increased comfort to the horse, and we have arranged to take the entire edition and send them to horse owners with a yearly subscription to COLMAN'S RURAL WORLD for $1.25. Send in your order at once, as they won't last long.

Address COLMAN'S RURAL WORLD,
621 Holland Building, St. Louis, Mo

Forest Grove, Oregon, March 15, 1913.
Mr. R. Boylston Hall,
40 State St., Room 43, Boston:

Dear Sir—I wish to apologise for not acknowledging receipt of your book on Horse Shoeing before. Your book arrived just as I was moving, and I didn't have time till a few days ago to read it. You certainly deserve full credit for your work and the congratulations of every horse owner. The easy and clear way you explain your principles makes it a book that everybody can read and understand, this alone being worth more than all the treatises written on that subject so far. Hoping that you are getting all the credit due to you, and again thanking you for remembering me, I am, yours

STOMACHS AND RATIONS.

Considering the size of the stomach of horses, which will hold from two to three gallons, it is ridiculous, yet tragical in the end, to see how some feeders perform the operation of feeding without thought or care for the results. The manger is stuffed full of hay, and a half-bushel measure is used to measure out the grain ration, and al lis supposed to go into a stomach of three-gallon capacity.

No wonder there is a pressure against the lungs causing short-windedness and heaves. No wonder there is indigestion, constipation, colic or worms. It takes hard work or strenuous exercise to work off such a square meal three times a day. Then it is a wonder a horse can outlive it. An idle horse certainly must fail with such a herculean task before him continually.

HORSE NOTES.

A lean face is suggestive of good quality in a horse.

Graceful carriage and stylish actions are leading qualifications in a carriage horse.

The coach horse is a luxury, the draft horse an every day necessity.

Flatness, brittleness and contraction are the three common defects in a horse's foot.

You cannot educate all horses the same way and have them come out alike.

A horse with a full stomach is neither fit for service work or rapid driving.

The levelness with which a horse walks is one of the best evidences that the legs work in harmony.

The draft horse must have strong, clear actions, both at walk and trot and plenty of life, and should not be fretful.

Liberal feeding of the young and growing colt is as necessary to make a good, well developed horse, as good breeding.

JACK AND JENNET SALE.

W. F. Schade of Jackson, Mo., writes that he has secured a big 50-foot tent with 9-foot walls, which will be supplied with comfortable seats and heaters, so that all who attend his big annual sale on Tuesday, February 10, can be dry, warm and comfortable, no matter how the weather may be.

XUM

FARMERS' CLOTHING.

One of the first essentials to the comfort and welfare of the farmer is a line of clothing suitable to our ever changing climate. This contributes not only to his health but in an indirect way to his success; for if one is to think and plan intelligently he must be in some degree comfortable. A wise physician told us long ago that we should keep the feet warm and the head cool and that this is one of the secrets of a good old age.

To begin with the feet: Provide felt or knit boots for the cold winter months, but have rubbers when it is warm and muddy; and it seems almost needless to say that these should be well dried out at night before putting on the next day. Felt boots, however, should be discarded when sitting in a warm room for any length of time, and the same with rubber boots as they will make the feet tender if worn constantly without changing.

Provide heavy woolen pants and woolen underwear when taking long drives in the cold, and a warm cap is also imperative. Heavy coats made of fur are excellent for severe winter weather and are a good investment for those who are constantly on the road. But whatever coat is worn it should not only be warm, but as nearly wind proof as possible and of proper fit. Tight clothing is an abomination and loose sloppy fitting garments are not much better. Occasionally a sweater is a fine garment to wear in frosty weather and is inexpensive.

To be well equipped in the clothing line there is a need for quite a variety of wearing apparel to meet the demands of our fickle climate. This will seem somewhat expensive to some but it is only the first cost that need be felt for, when there are several garments to be changed at intervals, they will wear much longer than where one set of clothes is worn exclusively. The writer knows of several shrewd farmers who keep several pairs of boots and shoes on hand instead of wearing one pair continually, as they not only last better, but it gives a chance for the unworn pair to become dry and sanitary during its period of rest. The same is true of clothing to some extent.

It will pay to be careful in dress when about to go out for hard work or choring, even when in a hurry. It will help to alleviate the ills of stormy weather and possibly save a doctor's bill. Always be prepared—take your coat to the field whatever the weather. It is as good advice as if formerly was to take a gun along on every trip when Indians and dangerous animals infested the country. Plenty of good suitable clothing to wear is better and cheaper than keeping the living rooms hot and stuffy to take the place of warm clothing as is done in too many instances.—H. E. White.

WOMEN AS FARMERS.

Women are coming to the front as farmers in many of our states. While they may not do the work of the farm, the give direction to the hired men. And they are proving themselves proficient as managers of farms. Success is crowning their efforts.

The state of Kansas alone has 1,200 women who are actually managing farms, and they are making good success of their agricultural life work. These women are scattered over the state, and some of them may be found in each of the 54 counties. Some women who own farms do not take part in the active management of them.

The reason these women are reaping success is simply because they have studied farming from a scientific standpoint. At least 98 per cent of these women are members of the farm institutes, and their names are on the mailing list for all the bulletins issued by the agricultural college. It is the reverse with men, for not over 20 per cent of them are looking out for something better.

Some of these women were school teachers, who on account of poor health gave up the school room for the farm. A large number of them are widows who were left farms by their deceased husbands. These were not afraid to take the farm into their hands and carve success from it for themselves and their children. Of course, there are some women who have bought farms outright, but quite a number who either inherited them or homesteaded. It is said that there were 16 women in the land race in Hamilton and Keaney counties when 10,000 acres of forest reserve lands were thrown open to entry.

The one reason for woman's success in farming is attributed to her devotion to the detail of the work. She neglects nothing. During the past season she has demonstrated that it pays to farm along scientific lines. As they had attended farm institutes and studied farm bulletins they were prepared to battle against the drouth. There was corn in many of their fields, while across the fences on the farms of men who paid no attention to farm study no corn came to maturity.—W. D. Neale.

THE ENLIGHTENED AGE.

One rarely picks up a paper of any kind nowadays without reading something about the enlightened age in which we are living. When such is forced upon us from every side, we are apt to take the thing for granted even though we have not investigated it to see if it is really true, says M. Anthony in Farmer's Guide.

The dairy world has been particularly dwelt upon in these articles, yet there are several things which must be improved before we can truthfully boast of enlightenment. We go on from day to day thinking that there can be no further improvement in dairy conditions. Yet one-half of the cows that are being milked are absolutely worthless for that purpose. They do not produce enough to pay for their feed, to say nothing of the time and care that must be given to them. Here is a chance for further enlightenment.

On the farms where these "spongers" are kept there is no careful and systematic saving of the manures. The manure of a single cow is worth $30 annually, if it is properly handled and placed where needed. Instead, it is often left to rot and wash away into gullies and creeks.

Hand in hand with the above conditions we find the old extravagant deep-pan method of cream gathering still in use, or even worse, the water dilution separator, or perhaps the practice of letting of the calf suck part of the cow. Where such methods are practiced every fifth cow must be kept to replace the products that are wasted.

On this same farm, and there are hundreds of them, no attention is paid to the selection of a good herd bull, but the assumption is made that any kind of bull will do. The fact is overlooked that if we are to produce meat we must start with the meat-producing tendencies, and if it is milk we must look for those qualities. Each is in opposition to the other, and will not bear mixing.

These things and hundreds of others that could be mentioned are not the sign hands of "enlightenment." Until these old-fashioned and impractical methods are discarded and new modern ones take their place, can we call this an enlightened dairy age and still have a clear conscience.

DOCKING HORSES AN OLD CUSTOM.

The cruel custom of docking horses is more ancient than we thought Mr. John Galsworthy quotes the following fro mthe records of the Council of Celchyth, A. D., 785:

"From the influence of a vile and unbecoming custom you deform and mutilate your horses. You cut off their tails, and when you enjoy them uninjured and perfect, you choose rather to maim and blemish them, so as to make them odious and disgustful objects to renounce."

There must have been some bishop or minister in that council who loved the horse and was responsible for this admonition. We venture the statement he was a man worth knowing."—F. H. H. in "Our Dumb Animals."

On November 26th, the superdreadnaught Warspite, which is to be armed with eight fifteen-inch guns, and which is Great Britain's largest warship, was launched. The vessel will carry sufficient oil fuel to make a voyage around the world.

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These remarks from a father to son are full of food for thought. **That which this father has done for his son, you can do for yourself;** or you can help do for your son, your brother, or the young man in whom you are interested. If you are an employer of men, encourage them to study law. It will come back to you a hundred times, in the increased efficiency of your employees. All you need is our help through our home-study law course and this you may have for a very small amount payable in small monthly sums.

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SPRING THE PROPER TIME TO WORK ROADS.

It is a great mistake to put off working roads until August or September, according to road experts of the United States Department of Agriculture. The roads should be worked when the soil is damp so as to make the soil bake when it dries out. If the roads are worked when they are dry it takes more power to draw the machine and besides dry earth and dust retain moisture and quickly rut after rains. The use of clods, sods, weeds or vegetable matter in building earth roads should be avoided because they also retain moisture.

If the working of the roads is deferred until the latter part of the summer when the surface is baked dry and hard, they are not only difficult to work, but the work is unsatisfactory when done. Earth which is loose and dry will remain dusty as long as the dry weather lasts, and then turn to mud as the rains begin. By using the road machine in the spring while the soil is soft and damp, the surface is more easily shaped and soon packs down into a dry hard crust which is less liable to become dusty in summer and muddy in winter.

Repairs to roads should be made when needed and not once a year after crops are laid by. Because of its simplicity, efficiency, and cheapness, the split-log drag or some similar device is destined to come into more and more general use. With the drag properly built and its use well understood, the maintenance of earth and gravel roads becomes a simple and inexpensive matter. Care should be taken to make the log so light that one man can lift it with ease, as a light drag can be drawn by two medium sized horses and responds more readily to various methods of hitching and the shifting position of the operator than a heavier one. The best material for the drag is a dry cedar log, though elm, walnut, box elder or soft maple are excellent. Oak, hickory or ash are too heavy. The log should be from seven to ten feet long, and from eight to ten inches in diameter. It should be split carefully as near the center as possible and the heaviest and best slab chosen for the front. When the soil is moist, but not sticky, the drag does the best work. As the soil in the field will bake if plowed wet, so the road will bake if the drag is used on it when it is wet. If the roadway is full of holes or badly rutted the drag should be used once when the road is soft and slushy.

The earth road can best be crowned and ditched with a road machine and not with picks and shovels, scoops, and plows. One road machine with a suitable power and operator will do the work of many men with picks and shovels, and in addition will do it better. If the road is composed of fine clay or soil it will sometimes pay to resurface it with top soil from an adjacent field, which has sand or gravel mixed with it. This method, called the "top soil method," is now in successful use in Clarke county, Georgia.

Storm water should be disposed of quickly before it has had time to penetrate deeply into the surface of the road. This can be done by giving the road a crown or slope from the center to the sides. For an earth road which is 24 feet wide the center should be not less than 6 inches nor more than 12 inches higher than the outer edges of the shoulder. The narrow road which is high in the middle will become rutted almost as quickly as one which is too flat, for the reason that on a narrow road all the traffic is forced to use only a narrow strip. Shoulders are often formed on both sides of the road, which prevents storm water from flowing into the side ditches, retaining it in the ruts and softening the roadway. These ruts and shoulders can be endirely eliminated with the road machine or split-log drag.

The width of the earth road will depend on the traffic. As a rule 25 or 30 feet from ditch to ditch is sufficient if the road is properly crowned. Ordinarily the only ditches needed are those made with the road machine which are wide and shallow. Deep narrow ditches wash rapidly, especially on steep slopes. The earth roads should not be loosened, dug up, or plowed up any more than is absolutely necessary. It should b gradually raised, not lowered; hardened, not softened.

THE REINDEER ONE OF ALASKA'S IMPORTANT INDUSTRIES.

There are not less than 30,000 domesticated reindeer in Alaska today, according to estimates of the Department of Agriculture. This means that the reindeer industry is by far the largest agricultural proposition in Alaska at this time, and more stringent government measures should be taken to prevent the rapid destruction of these animals. The industry under scientific management should develop rapidly, according to experts, and the present herds form a very promising basis upon which a great industry may be built.

It appears that there have been instances of cross-breeding domesticated reindeer and the native wild caribou. It is thought that the blood of the latter could be used to good advantage in building up the reindeer herds. At present the domesticated deer seem to decrease in size and otherwise degenerate because of the lack of careful selection of breeding animals. The caribou are superior in size and vigor, but are not of so wild a nature as to make their domestication impracticable.

That portion of Alaska which offers the newest other agricultural opportunities is the region best suited to the reindeer. So the industry may be developed without encroaching on other lines of farming. The existence of white reindeer-moss in all the Arctic region of Alaska permits the occupancy of vast regions that would otherwise be uninhabitable. The reindeer subsists mainly on this native herbage winter and summer. They require no shelter and little care beyond the restraint of a herder to keep them from wandering. The meat is of excellent quality and the skins are valuable. In Europe the deer are used for dairy and transportation purposes, and while little attempt has thus far been made in our territory along these lines, there are possibilities of similar development.

At present the individual ownership of reindeer is principally restricted to Eskimos and Indians. Some of the missions still possess herds and there are a few government herds. No breeding deer may be sold to whites. The Alaska division of the Bureau of Education has supervision of all herds, the teachers of the government school for native children located nearest a herd having immediate charge.

Besides the promising status of the reindeer industry in our Arctic possession, cattle and sheep raising, fruit raising and the problems of the homesteader in the far north are extensively treated in the Department of Agriculture's new bulletin—"Possible Agricultural Development in Alaska."

According to the investigators, there are unsurpassed cattle and sheep raising lands to be found on the Alaskan islands and in certain places near the shore on the mainland. Winter forage for cattle and sheep is provided largely from the native grasses, both hay and silage being made. The practicability of raising stock, however, except in small herds close to individual farms has not been sufficiently investigated to warrant more than an intimation of its possibilities. There are serious obstacles to be considered; the long winters, boggy land, mosquitoes and carnivorous animals. These objections, however, do not interfere seriously with the reindeer industry.

REARING CALVES.

The man who plans to rear his heifer calves should bear this point in mind: Vitality is one of the most important things to be developed in dairy stock, and it is obtained only through liberal feeding and proper care. And this is only partly true, for unless the calf is well born to start with, the best care and feeding will not produce a profitable cow.

MAKING FENCE POSTS LAST.

By E. C. Pegg.

Does it pay to treat fence posts with a preservative in order to make them last longer? Is it possible to treat cottonwood, elm, sycamore, or basswood posts so that they will last as long as a good white oak or black locust post does without treatment? The Missouri College of Agriculture has started an experiment which will help to answer these questions.

On November 30, 1913, the forestry department of the Missouri College of Agriculture set the last of 633 posts representing 27 different kinds of wood. The posts were set two feet deep on a level piece of land where soil and moisture conditions are the same for all. Posts of each species of wood were handled in seven different ways. Some were set in the ordinary way without treatment of any kind. These will serve as a check. Some were set in gravel so as to test the benefit, if any, from having better drainage around the post. Others had the lower three feet charred. Another series were given two brush coats of hot creosote, spreading it over the lower three feet. A fifth series was given one brush coat of hot carbolineum. The sixth series was treated with creosote by the open tank method described in Circular 51 of the Missouri Agricultural Experiment Station. The same method was followed with the seventh series except that the posts were soaked in creasote for two and one-half hours in each bath.

So the long distance race is on. Missouri farmers will be interested in watching this test of endurance. It will probably take a good many years before the whole race is finished and the last contender checked in, but long before the end we will know a few things about fence post durability and fence post economy that we only guess at now.

RACE BETTERMENT.

If it is true, as H. G. Wells makes his hero declare in one of his recent novels, that there is a collective mind apart and distinct from individual intelligence, then it must be admitted that the social intelligence of today is concerned as never before with the future and with the good of coming generations. Of this, the Conference on Race Betterment, just held at Battle Creek, Mich., is a striking illustration. Whatever one may think of the individual views expressed, or of the immediate, concrete results of such gatherings, says the Journal of the American Medical Association, the fact is in itself significant that such a conference, extending over five days and attended by thousands of people, is possible. Never before in the history of civilization have there been so many men and women who were earnestly, sincerely and unselfishly laboring for the general good. One may criticize their reasoning, dissect their statistics or draw from their premises entirely different conclusions, but the important fact remains that such conferences, which are becoming increasingly frequent, would have been impossible and practically inconceivable a generation ago. The pessimist and the critic see in such gatherings only another symptom of universal unrest and discontent. The optimist sees in them faintly foreshadowed the dawning of the age of which Tennyson sang, when each man's good shall be all men's aim. The purpose of the Battle Creek conference, as officially stated, was "to assemble evidence as to the extent to which degenerative tendencies are actively at work in America and to promote agencies for race betterment." Under the first head were papers on apparent increase in degenerative diseases, the causes of the declining birth-rate, crime, deterioration of civilized women, factory degeneration, alcohol and tobacco, social evil, and delinquent and defective children. On the constructive side were discussions on eugenics in many of its phases. The program impressed one as being overloaded on the degenerative side—possibly because of an overemphasis of the subject at the present time—and as too much given over to a discussion of the past and present conditions rather than of constructive plans for the future. The general effect left on the mind of the listener was that the many papers and addresses, most of them excellent in themselves, were not correlated and were written often from conflicting, if not contradictory points of view, while many of those in attendance impressed the careful observer as being earnest rather than informed, and zealous rather than discriminating. The impressive, undeniable fact, however, is that they were there. It is possible today, for the first time in the history of civilization, to call and to hold a conference to discuss not time-worn dogmas or even present-day needs, but future possibilities. From this point of view, such conferences must command the careful attention of the student of social development.

1913 RECORD
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All parts of the Provinces of Manitoba, Saskatchewan and Alberta, have produced wonderful yields of Wheat, Oats, Barley and Flax. Wheat graded from Contract to No. 1 Hard, weighed heavy and yielded from 20 to 45 bushels per acre; 22 bushels was about the total average. Mixed Farming may be considered fully as profitable an industry as grain raising. The excellent grasses full of nutrition, are the only food required either for beef or dairy purposes. In 1912, at Chicago, Western Canada carried off the Championship for beef steer. Good schools, markets convenient, climate excellent. For the homesteader, the man who wishes to farm extensively, or the investor, Canada offers the biggest opportunity of any place on the continent.
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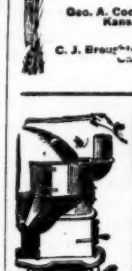

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BARRETT TO THE FARMERS.

Dreamers are allright if they materialize their dreams into something tangible, says C. S. Barrett.

Every great progress marked in the world's history was born in the dreams of some great thinker, who wrought his dream into concrete form. Dreams are but the visions of great souls building ships and railroads and skyscrapers and threshing machines and all the things going into the advancement of humanity.

The farmer boy following his sweating horse in the little furrow of mellow upturned earth dreams until life's horizon lifts and broadens for him. No available statistics are at hand, but very many of the men who mark the outposts of the world's onward progress dreamed in the furrow. Something about the contact with Mother Earth, the intimate association with her moods and her brooding heart begets stamina, character, stability and deep-rooted purposefulness.

So when some foppish young city chap with tailored suit, polished shoes and manicured nails sneers at the "the country bumpkin" don't let it disturb you, for your dreams made possible his bed of ease and wrought the city, the soft cushioned automobiles and the comforts he enjoys. Moreover, you are worth a dozen of him in doing life's work, for your bent back, your wrinkled and unkempt clothes, your horny hands and tanned skin result from doing the hard, the absolutely necessary work to keep this old world turning in its orbit.

But the dreamer drone who nods in the sun and lets the world rush by him has no place in the scheme of things. We have had hundreds of that sort in the Farmers' Union, who sits down and dreams that everything will come to him without effort on his part. Then he wakes up and quits because, as some one has expressed it, "they ain't doing airything."

Dream, but turn your dream into something.

HARD WORK OF FARMER'S WIFE.

"Why did you leave home?" asked a minister of a girl who had come from the country to the city.

"To escape washing dishes," she answered, promptly.

Years ago the farmers learned to substitute machinery for human labor outdoors. Thereby they accomplish a greater amount of work and do it less arduously. What wide-awake farmer would now walk seven miles to plow an acre, as farmers used to do a generation ago? Today not even the horses walk more than three and a half miles to plow an acre and the farmer does not walk a step. Indoors it is different, for there many women still walk nine miles to do one forenoon's housework. It is a hopeful sign, however, that some of them are bringing the fact out by wearing a pedometer; one woman who made the experiment was doing her tenth mile when she served the dinner.

A kitchen cabinet saves steps. Running water, hot and cold, throughout the house saves not only steps but labor. A pressure tank and a pumping outfit run by a gasoline engine, with a boiler connected to the kitchen range will save many times their cost in steps.

Although, by the use of modern implements the master of the farm saves not only his time, but his back, the mistress of the farm is still bending her back over the wash tub, the rubbing board, the broom or the old-fashioned stove. Again, although the most modern outdoor implements are a familiar sight, the light, ball bearing washing machine, the vacuum cleaner and the raised oven are wonders, known only through dealers' catalogues.

In old times it took two men to plant potatoes. Now it takes only one, and he does not plant them, for the potatoes ride on the back seat of a carriage and plant themselves, while the man sits in front and admires the view. But indoors the woman this man loves is still ironing clothes with a flatiron, still washing dishes by hand. If she knows anything about the machine that washes, dries polishes and sterilizes the dishes from an ordinary meal in less than 10 minutes, it is only to dream of it when she is worn out from doing the work by hand.

Whose fault is it? An easy and perhaps a natural answer is, "the farmer's" but it is not entirely just. The trouble with the average farmer is merely that he does not know. Naturally he is most intent on his own problem. He cannot be expected to keep track of every improvement in household machinery. He must be credited with progressiveness if he remains abreast of the times in matters that concern his own work.

The farmer's wife herself should learn the best ways of performing the routine work and the most modern aids to accomplish it. She should point out the seldom perceived fact that, whereas many of the most profitable outdoor implements are available only a few days in the year, indoor housework machinery is used every day and that most of the indoor conveniences are far cheaper than outdoor helps that her husband regards as indispensable.—Youth's Companion.

THE DRINKERS.

It is generally thought that Germany drinks more beer than any other nation in the world. This is a mistake. Germany comes second. The United States consumes 1,851,000,000 gallons of beer each year, which is 100,000,000 gallons more than Germany's consumption. Russia leads the world in its use of distilled liquors, and the United States comes second, with its consumtion of 133,000,000 gallons. Although the United States is first as a beer-drinking nation and second as a consumer of distilled spirits among the nations of the world, the liquor dealers of America are having a desperate fight for the life of their traffic.

The saloon has been expelled from one-half of the population and from two-thirds of the geographical area of the country. In 1868 there were 3,500,000 people living in territory where the drink traffic had been outlawed; in 1900 the number had increasedd to 18,000,000; in 1908, or only eight years after, the number had doubled to 36,000,000, and today there are 46,029,750 persons, or a fraction over one-half of the population of the country, living in no-license territory. In the last five years the no-license population has increased a little over 10,000,000, which is more than 10 per cent of the total population of the nation and 30 per cent increase in the number living in "dry" districts. Since 1868 the population of the country has doubled, while the number of inhabitants of "dry" territory has increased over thirteenfold.

IMPORTANCE OF EARTH ROADS.

Earth roads are more worthy of careful consideration than any other form of road, because of their extent. At present about 95 per cent of the roads of Illinois have only an earth surface. After all of the state roads now laid out have been improved, 80 or 85 per cent of the roads of Illinois will still have only an earth surface.

Drainage.

Drainage is the most important in connection with the construction or maintenance of any form of road particularly an earth one. Drainage alone will often change a bad road to a good one; and the best road, either earth or stone, may be destroyed by the absence of proper drainage.

A properly drained road will have three systems of drainage, viz, underdrainage, side ditches, surface drainage.

1. Under-Drainage.

There are three objects in underdrainage, 1, to lower the water level in the soil; 2, to dry the ground quickly after a freeze; and 3, to remove the underflow.

2. Side Ditches.

The side ditches should carry the water rapidly and entirely away from the roadside. Ordinarily they need not be deep; and usually they should have a broad flaring side toward the travelway to prevent accident if a vehicle should be crowded to the extreme side of the roadway. The opposite bank should be flat enough to prevent caving. If the side ditch does not open directly into a water course that will carry the water traversely away from the road, adequate provision should be made to get the water from the side ditch into a tile that will carry it away. Since the bottom of the ditch becomes covered with fine material brought down by the water, it is usually necessary to provide a man-hole so that the water can pass readily from the side ditch to the tile.

3. Surface Drainage.

The surface drainage is provided for by keeping the roadway crowned. Practically surface drainage is a matter of maintenance. The surface is maintained by the proper use of harrows, drags, and road scrapers.—Prof. Ira O. Baker, to Highway Engineers at Short Course.

FOR LAYING DUCKS.

One of the best rations for laying ducks may be made up of the following materials: Twenty parts of wheat, 20 parts of cornmeal, 20 parts of bran, 12 parts of prepared oat feed, 6 parts of boiled turnips or potatoes, 6 parts of green cut clover or refuse cabbage and 3 parts of grit. Mix well and feed as much as the birds will eat up clean twice each week.

O. H. Liebers, county agent, Gage county, Nebraska, has just assisted his association to select a car of Holstein cattle. The females were bought by fifteen different farmers and two registered Holstein bulls have been conveniently located. He reports that there is already a demand for another car of Holsteins.

The American Forestry Association has just elected Henry S. Drinker, president of Lehigh University, and P. S. Ridsdale, as its president and secretary respectively.

Mr. A. H. Beckhoff, county agent in Seward county, Nebraska, reports that 85 per cent of the farmers in that county have their seed corn selected.

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The Apiary

BEE-KEEPING ON THE FARM.

One branch of farming which has been greatly neglected in recent years is bee-keeping. A generation ago nearly every farmer kept a few colonies of bees, but at the present time the farmer who owns bees is the exception and not the rule. Bees have a two-fold value to the farmer, for besides the profit which he derives from the honey, they are of great importance in securing more complete pollenization of the flowers of trees and plants. An increase in the number of colonies kept in any section of the country will insure the fertilization of the flowers on which the bees work, and will result in better crops.

In bee-keeping may be found light, profitable employment for those who are unfitted for more strenuous labor. Many women are succeeding with bees. For the general farmer, a few colonies of bees will require but little time and if they are rightly managed, they will yield a generous supply of honey. There are many small farms which are managed along the line of poultry and truck farming, where bee-keeping may be added, and a third source of profit derived from the sale of honey.

The number of colonies that may be profitably kept in one locality d epends altogether upon the quality of honey producing plants which are growing within two or three miles of the apiary. Where basswood, locust or tulip trees abound in the forests, or where the pastures or roadsides are covered with white or sweet clover; or where alfalfa, alsike clover or buckwheat are grown in abundance, from 100 to 400 colonies have been successfully kept in one apiary. In at least one instance—the famous McIntire apiary in California—600 colonies were kept in one place, and they yield per colony was satisfactory.

However, where the bee pasture is scanty, too many colonies in one apiary will result in overstocking the range, and the bees will not do so well as they otherwise would; but in most localities bee pasturage is plentiful enough that at least several dozen colonies will succeed in gathering a surplus of honey. To get the best results from bees they must be well cared for, although they will probably stand more neglect than any other kind of "live stock"; in many cases a few colonies in old-fashioned box-hives have furnished the farmer's table with honey for years, with no care or attention except to hive the swarms that came off.

Honey varies in quality and color from the clear, mild-flavored product gathered from white clover or alfalfa to the dark, strong honey yielded by buckwheat and some varieties of weeds. The lighter colored grades are usually conceded to be the best, but many who are accustomed to the stronger flavor of buckwheat honey prefer it. All fruit and berry bloom yields a good grade of honey, and that obtained from white, alsike and sweet clover, and from basswood and locust, makes up the greater part of the honey produced in the northern states. A honey flow is sometimes obtained from goldenrod, asters, milkweed, and other weeds which blossom in the latter part of summer and fall; this late honey flow is important, as it enables the bees to keep up brood-rearing till late in the season, and thus start into the winter with plenty of young bees, and a good supply of stores.

For those who wish to start in bee-keeping by purchasing one or more colonies of bees, spring is the best season to begin. The bees will then have safely passed through the winter, and the purchaser can tell if the colony is strong and well supplied with stores. If the bees are not flying vigorously on a warm, calm day in March or April, the colony probably does not contain enough bees to insure its success. It is a good plan for a beginner to invest in only a few colonies until he learns some of the details of their successful management. There are many different styles of hives in use, made on the movable comb or frame plan, besides the old-time box hives, which are made without frames. Success with bees probably depends more upon good management than upon the style of hives used, but some one of the many styles of frame hives will be found the handiest and most economical of time and labor in caring for the bees.

Any one who is not used to handling bees had better protect himself with a bee veil and bee gloves. These articles are inexpensive, and when equipped with them, and a good smoker, even the inexperienced need have no fear or difficulty in performing the ordinary operations of caring for bees. First, however, he should invest in a reliable book on bee-culture, one written by a modern, practical bee-keeper, and from this book he may learn the basic principles which lead to success in working with bees.

The science of bee-keeping has advanced as rapidly as any other branch of farming, and the bee-keeper who does not avail himself of the latest knowledge and methods of management is working at a disadvantage. There is so much that is fascinating and marvelous about the lives of the industrious little toilers, that once a man becomes interested in them, he is likely to become an enthusiast on the subject.

The product of a hive in a good season may run anywhere from 10 to 100 pounds of comb honey, or even more, depending on the locality. If more is produced on the farm than is wanted for home use, it is always readily salable, if of good quality, at prices that pay well for the time and money invested. The usual retail price is from 20 to 25 cents per pound, and those who have an established reputation as producers of fancy honey can easily secure buyers for any surplus. A conservative estimate of the average net profit per colony, based on many years actual experience, is $3 annually. But even though there is no surplus produced for market, the fact that honey is, to most persons, the most healthful and appetizing sweet, justifies its more extensive use on the farmer's table.—John March, Jefferson Co., O.

XUM

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MEN FOR ELECTRIC RAILWAY—Motormen and conductors; fine opportunity; about $80 monthly; experience unnecessary; no strikes; state age. Address F. H. F., RURAL WORLD office.

FARMS WANTED.

WANTED—Improved farms and wild lands. Best system for quick results. Full particulars and magazine free. Don't pay big commissions. Western Sales Agency, Minneapolis, Minn.

WANTED—To hear from owner who has good farm for sale. Send description and price. Northwestern Business Agency, Minneapolis, Minn.

FARMS FOR SALE.

FARM FOR SALE—The very best truck farm in Southern Illinois, 2½ miles from Mt. Vernon, Ill., 43 acres, two sets of improvements, abundance of water; on main road, rural route, telephone line. I have been gardening here eight years and the land is in highest state of cultivation. The land has been heavily manured and tons of fertilizers used every year. Good market for truck here. Two acres of fine spinach, Hot beds made. This is a property that will pay immediately. Address A. N. Cheviron, Mt. Vernon, Ill.

ARKANSAS LAND FREE—600,000 acres vacant Government land now open to settlement. Booklet with lists, laws, etc., 25c. Township map of State, 25c additional. L. E Moore, Little Rock, Ark.

SEED CORN.

SEED CORN—White Elephant, selected quality, both old and new, all graded tested seed, $2.00 per bushel shelled. Robt. Plate, Mexico, Mo.

SEED CORN: Johnston County and Iowa Silvermine, $2.30 per bushel shelled, $3.00 crated. Also 1912 raised Silvermine. Emil J. Meyer, Cape Girardeau, Mo., Route 2.

SEED CORN—Orders now taken for Boone County White, Johnson County White, Reid's Yellow Dent and Leaming seed corn, to be shipped later, on approval. Prices: $2.50 per bu. shelled and graded, $3.00 crated Order early. Oaklawn Seed Farm, Chatham Illinois.

CORN—1000 bushels pure bred high yielding seed corn. Dunlap, Williamsport, Ohio.

ORDERS now taken for Johnson County Seed Corn, to be shipped later. Prices $2.50 per bushel shelled, $3.50 per bushel crated seed. The supply of seed corn will not half equal the demand. Order early C. D. Lyon, R. 1, Georgetown, Ohio.

CLOVER SEED.

FOR SALE—Selected red clover and Indiana grown barley direct to farmers in any size shipments. Write for samples and prices. Townley Grain & Supply Co., Monroeville, Ind.

NEW WHITE SWEET CLOVER SEED—Also, leaf tobacco. J. T. Mardis, Falmouth, Ky.

GINSENG.

GINSENG—Roots for this spring setting; 2 years old at $30, 3 years old at $50 per thousand; latter bear seed this year; guaranteed good, clean stock. A. Pace, Box 303, Grove, Okla.

GINSENG SEED—Choice Ginseng Seed $1.25 per 1000. Each thousand produces over $200.00 worth of ginseng. Every farmer should grow it. Order now. E. Douglass, Brawley, Mo.

JACKS AND JENNETS.

FOR SALE—Ten head splendid jacks, yearlings to jacks 15-3. Would lease a stallion to responsible parties buying a jack. Twenty head good jennets. Will trade. One extra February roan bull calf, pure bred. Wilmer L. McIlroy, Louisiana, Pike Co., Mo.

HORSES.

STALLION—For sale, a coming 3-year-old registered trotting stallion, grandson of Ashland Wilkes 2:17¼, sire of 63 trotters and 57 pacers; large; $250; other breeding stock. W. A. White, Sarcoxie, Mo., R. R. 2.

TROTTING STALLIONS for sale, cheap. Standard bred and registered; 16 hands; weighs 1200 pounds, gentle driver and a sure breeder. For particulars address Chas. Schiek, Freeburg, Ill.

FOR SALE—A few standard and registered stallions, twelve yearling colts and fillies. Write for prices and description. Colman Stock Farm, Creve Coeur, Mo.

LIVE STOCK.

FOR SALE—Ten choice registered bull calves for sale, from two to eleven months old, from high-class, heavy-producing Jerseys. Write me for prices, stating age you want. D. S. Mayhew, Monett, Mo.

POULTRY.

ROCKS, reds, silver laced Wyandottes and Brown Leghorns; eggs by express or post. Write for free poultry book. Sunnyside Poultry Farm, Box 22, Owensville, Mo.

EGGS—From B. P. Rocks, Rhode Island Reds, White Orpingtons; all of the best strains; prices $2 per 15; $3.50 per 30; $5 per 45; satisfaction guaranteed. Mrs. M. E. Orewyler, Miami, Okla.

EGGS—15 fertile eggs, postpaid $1; from pure single comb Brown Leghorns. Mrs. Kenyon, Tyrone, Okla.

WANTED—Six or eight cockerels, Barred Plymouth Rock, White Plymouth Rock and White Leghorns. Jesse T. Wallace, Hackberry, Arizona.

SELECTED EGGS—R. C. Reds, S. C. W. Leghorns and Fawn I. R. Ducks 15, 75c; 100, $4.00. G. Kitterer, Emma, Mo.

FOR SALE—Buff Orpingtons, hens and pullets; choice breeders. Price, $1.00 each. Also extra choice yearling cock bird; price, $3.00. Geo. L. Snider, Fruitland, Mo.

WHITE WYANDOTTES—Early cockerels, $2.00 each. Eggs in season. J. D. Bradshaw, Barnett, Mo.

MUST SELL—Lease expires; 250 Single Comb White Leghorns; Missouri State Fair and St. Louis winners; clover cutter, bone cutter, Simplex stove, incubators. Kruse Poultry Farm, Kirkwood, Mo.

FOR SALE—A few choice R. C. Rhode Island cockerels; prices $1.50 and $3.00 each. Booking orders for eggs at $1.50 per 15 eggs. J. Ed Green, Blodgett, Mo.

FOR SALE—Full-blooded Mammoth Pekin ducks. Eggs $1.00 per setting. Address Mrs. A. Brower, Rinehart, Mo.

FOR SALE—A few fine black Langshan cockerels, $1.25 each; L. E. Meyer strain; good winter layers. Myrtle Johnson, Windsor, Mo., R. 21.

MY CHAMPION BRONZE TURKEYS win for my customers in 25 states; young toms, 25 lbs., with pure white edging, $10 each; fine breeding trios, mated to produce fine, large offsprings, $15.00. Ike Hudnall, Box 84, Milan, Mo.

FOR SALE—12 English Penciled Indian Runner Drakes; $2 to $5 each; eggs, $1.50 to $3 per 15; won first on drake at Kansas City show. D. J. Mackey, Pittsburg, Kans.

SINGLE COMB WHITE LEGHORNS—Fine lot of cockerels and cock birds; $1.50 and $2.50; reduced price for six or more. Silvery white birds. J. E. Haynes, Prairie du Rocher, Ill.

FOR SALE—A few fine cockerels; White Orpington, White Leghorn, Mottled Ancona and Black Minorca. Also drakes; Pure White, Fawn and White, and Buff Orpington. Prices reasonable. Correspondence solicited. Box 1, Jonesburg, Mo.

BARRED PLYMOUTH ROCKS—Both matings; eggs reasonable for the quality. Won 1st, 2d and 5th pullets, 1st, 2d, 3d and 4th cockerels, and 1st and 2d hens at Jefferson City, Mo., with 143 Barred Rocks on exhibition. W. W. Graves, Jefferson City, Mo.

RURAL WORLD WANT ADS.

HOGS.

MEADOWBROOK STOCK FARM, L. M. Wade, Prop., Centretown, Mo. Breeder and raiser of thoroughbred Poland China hogs. Prices reasonable. Young stock for sale at all times. Correspondence a pleasure.

POLAND CHINAS—Size and bone with quality; open spring gilts by Longfellows Special 64200, $20 to $25 each; gilts bred to Ott's Big Oranga 2d 68131, $25 to $35 each. Fall pigs by Longfellow's Special 64200, and Sensation Chief 67433, $16, crated, in December. A. F. Siefker, Defiance, Mo.

HOGS—350 big type Mulefoot Hogs for sale. Dunlap, Williamsport, Ohio.

TO EXCHANGE

FOR SALE—One 5-room cottage, modern, one 5-room cottage, 3 acres of land; two stallion colts 2 years old, by Rex McDonald; two registered harness stallions; two registered Percheron stallions, all sound and no better breeding. Will trade this property for a small improved farm close to St. Louis in Illinois, or will sell and give terms. For further information address Robert White, Springfield, Mo.

MISCELLANEOUS.

ATTENTION—Formula for killing all lice, vermin, etc., on the hen and in the nest, for 25c silver. R. H. Constable, Box 202, Johnstown, Pa.

RECIPES—I believe that I have ten of the best cake and candy recipes that can be had; I have had my typist strike off a few copies. Will send you a set for 10c. H. H. Hicks, 74 Pilling st., Brooklyn, N. Y.

BEGIN early for a profitable 1914; sell the Imperial Self-heating Iron; $15.00 to $20.00 per day profits; salary or commission; agents wanted everywhere. Imperial Sad Iron Co., Memphis, Tenn.

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CHERRYVALE (KAN.) NOTES.

Editor RURAL WORLD: I see by the papers there are some wondering why corn dropped 10 cents a bushel. I don't think they need to look very much to find the cause, and it ought to go lower for the good of all but the gamblers in futures. When it was seen that the corn crop would be short they commenced to gamble as to how much it would be short, and run the price out of sight. The corn crop was large but very short in a large territory. Well farmers saw they were up against it with the 1912 crop cornered and corn 90 cents to $1 a bushel, and to be hauled from the towns to the country there was no profit in feeding, so most of the old sows went to market in place of raising a litter of pigs, and last spring pigs went to market at from 125 to 150 pounds, so by gambling in the corn crop the pork was cut short and the pig crop for next summer's pork, and the demand for corn is cut and it is accumulating in the grain centers from five million bushels last year this time to twelve million bushels now. Had the gamblers let the market alone and let the demand raise the price as the corn was needed, farmers would have made some money and been in better shape to supply the demand for meat next year and consumers would have paid less. H. BELLAIRS.

MARIONVILLE (MO.) NOTES.

Editor RURAL WOLRD: Snow is falling here today; it has been snowing about two hours; ground is hid from view; have had some warm weather, the past three days having been as pleasant as in May. Farmers have got in good way plowing, but will have to rest from their labors for awhile at least. There has been more plowing done in this section this winter than for many winters. If we have a good season in 1914 we are sure to have a bumper corn crop. The farmers are plowing many acres of old pasture and meadow on account of the dry hot weather killing about all the grass on those lands. Many of those lands have been pastured several years and are ideal corn land. There has been more old fence rows and waste patches of land cleared up this winter than for many years. This is due to so much nice weather; there has been but a few days this winter that were too bad to work. People are farming fewer acres and doing it better than when they tried to farm more acres and slighted their work. Fence rows that had been neglected until the briars and brush and vines had spread 10 to 20 feet from fence have been cleared up, which has given the farms a noticeable appearance. I have plowed up two fence rows this week; the fence was a barbed wire one and the post about all rotted off at the ground so I rolled the wire up, and plowed the entire row. I will put in a woven smooth wire fence, as I don't want any more barbed wire—too many good horses damaged by barbed wire, and can hardly make a hog-proof fence with barbed wire unless the posts are set close together. If the remainder of the winter weather is as mild as the past winter weather has been, most of our farmers will have shock fodder enough to rough their cattle through. Had we had a severe winter many head of live stock would have suffered; with the exception of a few days this winter our live stock has done well on our green rye and wheat pastures.

On the 19th of this month I butchered three 300-pound hogs which produced 24 pounds of lard. I have 17 more 300 pounders that I will put on the market next Saturday at 8 cents per pound. Good money in hogs if they are properly cared for. Have 26 shoats I am feeding. I have one thoroughbred Poland China sow, one red and two white ones. I like the Polands best.

We have the white Plymouth Rock chickens and white Pekin ducks. We will get white geese in the spring. We have some very nice white Plymouth Rock cockerels for sale. Good seed corn is very scarce in this section. I have 250 barrels apples for sale—nice clean stock.

Orchardists have been taking advantage of the fine weather by plowing and cleaning up their orchards and plowing the orchard land. By plowing the orchard land at this season of the year we will plow out of the ground many worms and insects which will be destroyed by the cold weather, and by plowing our corn land we will destroy many worms. Where I plowed old meadow land last winter I had no cut worms last summer, but where I plowed a part of this same meadow last spring I had a good supply of worms. We make better crops on fall and winter plowed lands. The vegetation which was plowed under in fall and winter are fairly decomposed by planting time and the ground will dry out earlier in spring so that we can plant our crops earlier. Take it one year with another, the early planted corn, oats and potatoes do better than the late planting.

E. N. HENDRIX,
Farm Student and Information Seeker.

If you have anything to sell or exchange try a small classified ad.